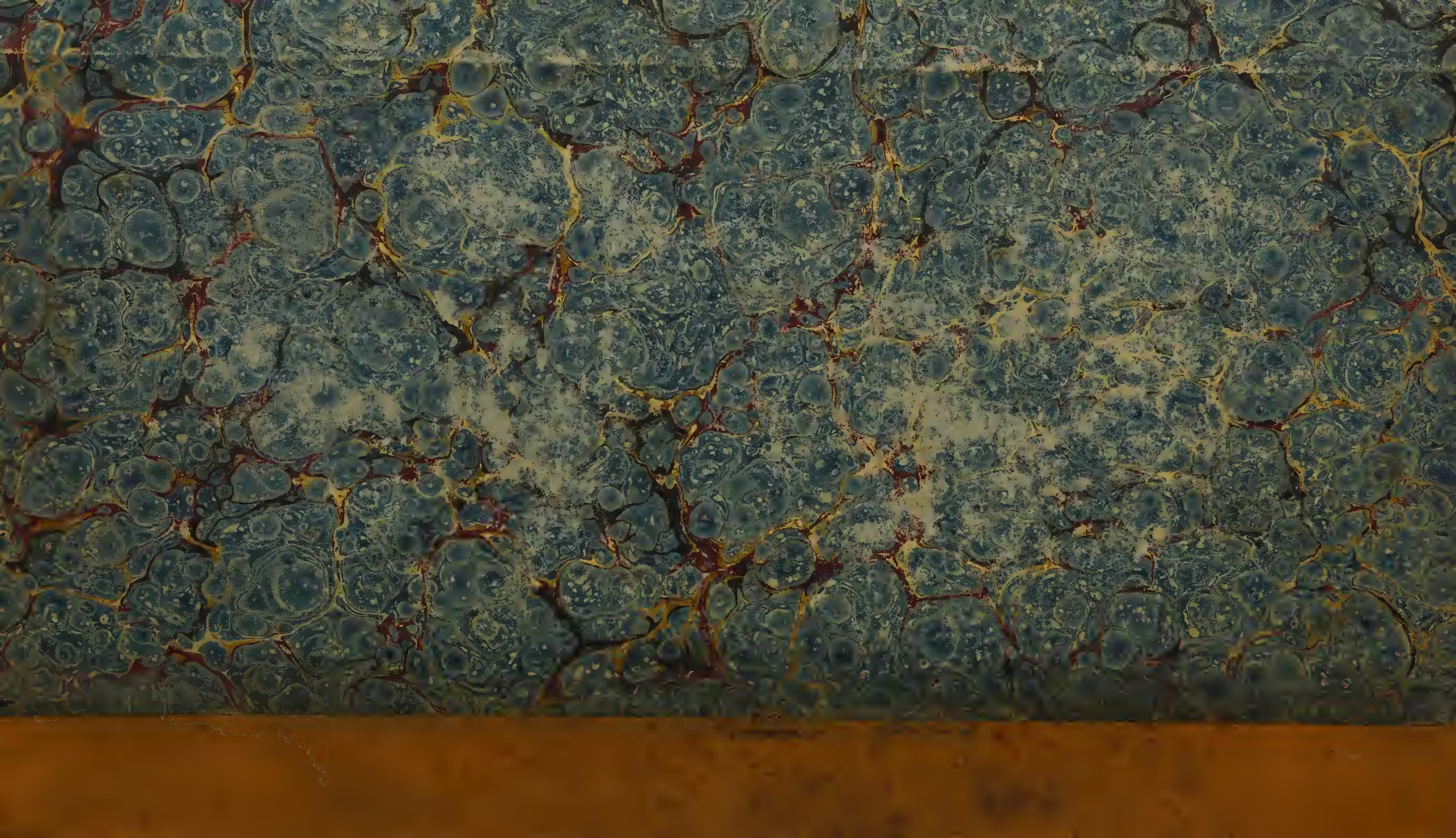

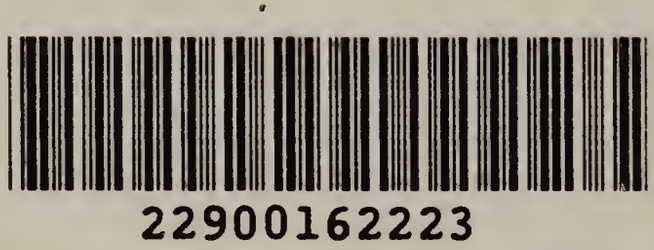
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PHARMACEUTICAL JOURNAL

AND

TRANSACTIONS.

SECOND SERIES

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THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. I.—JULY 1st, 1862.

CONFIRMATION OF THE NEW BYE-LAWS OF THE PHARMACEUTICAL SOCIETY BY THE SECRETARY OF STATE.

We have much pleasure in stating, that the Bye-Laws which were confirmed and approved at a special general meeting of the Society on the 15th day of January last, and published in full in the January number of this Journal, together with the Amendments made on the 16th of April, and published at page 550 of the May number of this Journal, have received the sanction of her Majesty's Secretary of State, which was given on the 23rd of June; and the code of Bye-Laws thus confirmed is now, therefore, in operation.

It should be distinctly understood, that the questions relating to the terms of registration and of admission into the Pharmaceutical Society are definitely and permanently settled by these Bye-Laws, and that no one can henceforth be placed on the Register of Pharmaceutical Chemists without previously passing the required examination before the Board of Examiners of the Pharmaceutical Society.

THE USE OF METHYLATED SPIRIT IN PHARMACY.

When, in 1855, a law was passed to allow spirit of wine mixed with wood-naphtha to be used for certain purposes duty-free, the objects contemplated were twofold—first, to promote the advancement of the arts and manufactures, and secondly, to prevent as far as possible the illicit distillation of spirit of wine. The Act for regulating the preparation and sale of methylated spirit was founded upon the report of a Commission, consisting of three Chemists, to whom the subject had been referred by the Chairman of the Board of Inland Revenue. In their report the Commissioners state that spirit of wine may be rendered unfit for human consumption as a beverage, without materially impairing it for the greater number of the more valuable purposes in the arts to which spirit is usually applied, by mixing with it ten per cent. of purified wood-naphtha; and that this mixture resists all means that could be practically adopted for effecting the separation of the ingredients, or the purification of the spirit so as to render it likely to be used as a beverage. Much benefit was anticipated from the introduction of methylated spirit in many branches of manufacture, especially in hat-making, in the manufacture of varnishes, and the preparation of some chemical products. These anticipations have been fully realized, and the employment of methylated spirit appears to have

undergone a continued, although gradual extension up to the present time. The first object contemplated in the introduction of the measure has been thus fulfilled; nor has the second object been less successful, for illicit distillation has been to a great extent prevented. It has happened unfortunately, however, that in order to break down the trade of the illicit distiller, it was considered necessary by the Board of Inland Revenue to allow the use of methylated spirit in the manufacture of sweet spirit of nitre, and some other Pharmaceutical preparations which had previously been made to a great extent from illicit spirit. The Commissioners, in considering the probable effects of allowing the use of methylated spirit in manufacturing operations, had foreseen the difficulties that might arise with reference to its applications in Pharmacy, unless some restrictions were placed upon its use for such purposes. They did not propose or contemplate its use in sweet spirit of nitre, although aware that the Excise authorities were anxious to provide the means of allowing this popular medicine to be made from duty-free spirit as a provision essential to the prevention of illicit distillation. In reference to this subject, the Commissioners state :—

"Sweet spirit of nitre is used exclusively in medicine, but being a popular remedy the quantity consumed is very considerable. We may state with reference to this article that it is made by distilling a mixture of spirit of wine and nitric acid, and that when properly prepared it consists of a solution of a small quantity of nitrous ether in spirit of wine. The proportion of nitrous ether is extremely variable, and in some commercial samples is so small as merely to impart a slight flavour to the spirit, which flavour, moreover, is by no means disagreeable. From information derived from those practically acquainted with the commerce of this article, it may be inferred that a large proportion of the sweet spirit of nitre now used is made from illicit spirit, the price at which the wholesale dealer can purchase sweet spirit of nitre being less than that at which it can be produced with spirit on which the duty has been paid. It is scarcely to be expected that spirit which has been rendered permanently unpotable can be used for making sweet spirit of nitre, as the peculiar and unobjectionable flavour of that compound is the popular test of its good quality. When made with the methylated spirit, the compound acquires a disagreeable flavour, which is more especially developed on diluting it with water; and it is impossible to recover the alcohol again in a pure state from such sweet spirit of nitre. On the other hand, the separation of pure alcohol from good potable sweet spirit of nitre, such as the public are accustomed to use and require, is attended with no difficulty. It appears improbable, therefore, that any regulations could be devised for the preparation of sweet spirit of nitre from duty-free spirit which could be adopted with safety to the revenue."

It is much to be regretted that the Commissioners failed to induce the Board of Inland Revenue to relinquish the intention of allowing sweet spirit of nitre to be made from duty-free spirit. The Board were determined, if possible, to break down the trade of the illicit distiller; and to enable them to do this, they considered it necessary to cut off those parts of his trade which he carried on with least danger of detection. By allowing sweet spirit of nitre to be made with methylated spirit, the price of the article was at once reduced to a point at which the illicit distiller could not compete; but at the same time the first step was taken towards the introduction of a practice which, if it be not checked, will bring much discredit upon the members of the Pharmaceutical profession.

The Commissioners, in the report to which we have already referred, say :—

"Spirit of wine is used as a solvent and menstruum for administering the active constituents of animal and vegetable substances used in medicine in

the form of tincture, spirit, etc. These preparations being intended for the treatment of disease, and their efficacy frequently depending upon the association of substances which, from long experience, have been found to contribute to the required result, the unauthorized introduction into their composition of a new substance, and especially one of so marked a character as methylic spirit, cannot in any way be sanctioned. There is a large number of Pharmaceutical preparations of the sort here referred to, most of which are made according to formulæ given in the Pharmacopœias, a strict compliance with which is enjoined upon those who compound them. We cannot recommend the substitution of any mixture for the pure spirit directed to be used in making these preparations."

The Commissioners appear to have expected that the restrictions which it was proposed to place upon the use of methylated spirit would have especially applied to Pharmacy, and they trusted to such restrictions for the prevention of evils which were seen to be otherwise inevitable. On the other hand, the Board at Somerset House have acted simply as guardians of the public revenue, leaving the interests of Pharmacy to be protected by the Pharmaceutical Society and the College of Physicians.

When it was found that methylated spirit was being used for the preparation of tinctures, the subject was inquired into by the Pharmaceutical Society, and representations were made on the subject to the College of Physicians, and also to the Board of Inland Revenue. The College issued a caution to druggists not to employ methylated spirit for any Pharmaceutical preparations, and the Excise have continued to issue their licenses subject to this caution, and, as we understand, subject also to the condition that the methylated spirit is only to be used in its unpurified state. That the injunctions of the College and the regulations of the Excise are disregarded in too many instances, is a fact known to most of our readers. Attention is called to this subject by two correspondents in this month's Journal, and we trust some means may be devised for putting a stop to the practices referred to.

LEGISLATION AFFECTING PHARMACY.

The recognition of the Pharmaceutical Society by the Legislature in the Pharmacy Act was accompanied by the privilege, which at the same time was accorded to Members of the Society and other Registered Chemists, of using a title which implies professional qualification; and the exclusive right to use this title has been hitherto the only acknowledged advantage given by the law to those who devote the time and incur the expense involved in qualifying themselves for registration under its provisions. But the value of registration has not yet been sufficiently appreciated. The mere fact of being included in a register, established and maintained under the provisions of an Act of Parliament, is of itself an important advantage, as it forms the basis of recognition for the granting of privileges. Thus, a question has just arisen with reference to a Bill before Parliament as to the practicability of exempting Chemists and Druggists from serving on juries; and it is probable that this exemption will be made to apply to Registered Pharmaceutical Chemists, and confined to this part of the pharmaceutical body, as they alone admit of legal definition and identification. The advantage of registration will thus become obvious, and the proposed exemption, if granted, will be an important step towards the encouragement of pharmaceutical qualification and progression.

LEGISLATION AFFECTING PETROLEUM.

The numerous accidents which have arisen from the ignition of the very volatile vapour of some of the oils now so extensively used under the names of petroleum or paraffin oils, have led to the introduction into Parliament of "a Bill for the Safe-Keeping of Petroleum." This Bill proposes to enact that the term "petroleum," for the purposes of this Act, shall include any product thereof that gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer; and, that not more than twenty-five gallons of petroleum shall be kept within one hundred yards of a dwelling-house or of a building in which goods are stored, except in pursuance of a license given by certain local authorities specified in the Bill. The license may have such conditions appended as the local authority granting it may think necessary for diminishing the risk of damage from explosion or fire. Any petroleum kept in contravention of these regulations is to be forfeited, and the owners of the petroleum and of the premises in which it is kept are each to incur a penalty not exceeding twenty pounds for every day during which it is so kept.

It is worthy of observation with reference to this Bill, that it proposes to deal with "petroleum" and *any product thereof* that gives off an inflammable vapour below 100° Fahr. Now, the term petroleum is generally understood to mean natural rock-oil; and if this be the definition of the term, it will not apply to oils obtained by distillation from shale, coal, and peat, some of which are, we believe, as dangerous as the natural rock-oil. We think the term petroleum ought to be better defined than it is in the Bill.

PHARMACY AT THE INTERNATIONAL EXHIBITION.

In compliance with the promise made in our last number, we proceed to give a detailed description of the chemical and pharmaceutical products in the Great International Exhibition, commencing with a list of the contributors, and a statement of the contributions, to the collection formed by the Committee of the Pharmaceutical Society. We gave a general description of this collection last month, and named many of the contributors; but the list before us was not then complete,—indeed the collection had not been finally arranged.

There appear to be sixty-one contributors to this collection, whose names are arrranged here alphabetically:—

Alfred Allchin, Coles Terrace, Islington.—Smelling salts, and solution of the colouring matter of alkanet root.

Henry Allen & Co., Charterhouse Square.—Socotrine and Barbadoes aloes, and their aqueous extracts, compound extract of colocynth, some concentrated decoctions and infusions, etc.

Allen & Hanburys, Plough Court, Lombard Street.—The diluted acids and distilled waters used in medicine, some chemical preparations and drugs.

Adolphus Arnold, Guernsey.—Iodine and iodide of potassium, made in Guernsey.

Baiss, Brothers, Leadenhall Street.—Gingerine, capsicine, soluble balsam of copaiba, essential oils, and a large number of drugs.

Samuel Banner, Liverpool.—Effervescing carbonate of iron, and granulated medicines.

J. B. Barnes, Knightsbridge.—Podophyllin, extract of ergot, etc.

J. Bell & Co., 338, Oxford Street.—Medicinal extracts, cod-liver oil, ointments, lard, benzoated lard, medicinal wines, and a large number of drugs and other preparations.

Augustus Bird, High Street, Kensington.—Syrup of poppies, saffron, ginger, tolu, etc., cod-liver oil, etc.

Blake, Sandford, & Blake, Piccadilly.—Carbonate and citrate of lithia, the effervescing waters of the Pharmacopœia and other mineral waters, syrups, tinctures, liquors, cerates, ointments, etc.

J. W. N. Brewer, Liverpool Street.—Syrups, liquors, cod-liver oil, etc.

C. F. Buckle, North Place, Gray's Inn Road.—Orange and lemon peel.

W. H. Bucklee, New Bond Street.—Tinctures of capsicum, iodine, guaiacum, etc.

Butler & McCulloch, Covent Garden.—Dried medical herbs.

Dr. Crace Calvert, Manchester.—Pure carbolic acid for use in medicine, picric acid and picrates.

H. B. Condy, Battersea.—Manganates and permanganates of soda, potash, etc.

Edward Constance, Leadenhall Street.—Liquors, concentrated infusions, and extracts.

Corbyn & Co., 300, Holborn, and 7, Poultry.—Tinctures and medicinal wines.

Cox & Gould, Chicksand Street, Whitechapel.—Acetate of copper, salts of potash, soda, etc.

Curtis & Co., Baker Street.—Liquors, concentrated infusions and decoctions, and syrups.

Darby & Gosden, Leadenhall Street.—Medicinal spirits and extracts.

J. T. Davenport, Great Russell Street, Bloomsbury.—Liquor potassæ arsenitis, and other solutions of the Pharmacopœia, citrates of iron, syrups, etc.

Davy, Macmurdo, & Co., Upper Thames Street.—Syrups, gingerine, capsicine, sweet spirit of nitre, liquors, and numerous chemical preparations.

Henry Deane, Clapham.—Tinctures and liniments.

Dinneford & Co., New Bond Street.—Compound powders and confections, etc.

Evans, Lescher, & Co., Bartholomew Close.—Cod liver oil, castor oil, flexible membrane capsules, drugs, etc.

Fisher, Son, & Haselden, Conduit Street.—Liquors, tinctures, solutions, confections, chloric ether, etc.

Foot & Co., Battersea.—Acetic, nitric, and hydrochloric acids, carbonate and phosphate of lime.

Alexander Garden, Oxford Street.—Peroxide of hydrogen.

Thomas Gissing, Wakefield.—Liq. opii sedativus and liquor taraxaci.

J. G. Gould, Oxford Street.—Dried fruit of Indian bael.

Thomas Greenish, New Street, Dorset Square.—Syrup of superphosphate of iron, tinctura folii ricini, liquor folii ricini.

T. B. Groves, Weymouth.—Aconitine and some of its salts.

Herring & Co., Aldersgate Street.—A large number of drugs and essential oils.

Robert Hogg, Albion Street, Hyde Park.—Mineral waters.

William Hooper, Great Russell Street, Covent Garden.—Carbonate of ammonia.

William Hooper, Pall Mall East.—Extracts inspissated in a current of dry air, and artificial mineral waters.

JOHN HORNCASTLE, Stanhope Terrace, Hyde Park.—Liquors, syrups, citromel, tartromel.

HORNERS, Bucklersbury.—A large number of drugs.

HOWARDS & SONS, Stratford.—A large number of chemical preparations used in medicine.

JACOB HULLE, Battersea.—Indian opium, castor, sulphate of quinine, strychnine and its salts.

HUSKISSON, Swinton Street, Gray's Inn Lane.—Bicarbonate of soda, and several chemicals.

B. W. LACY, Westbourne Grove.—Pod of musk.

HENRY LAWRENCE, Kensington.—Cod-liver oil and steel wine.

HENRY LONG, Notting Hill.—Tinctures and powders.

HENRY LONG, Croydon.—Ointments, tinctures, etc.

JOHN MACKAY, Edinburgh.—Tinctures, spirits, and preparations of the Edinburgh Pharmacopœia.

M'CULLOCH & SQUIRE, Coleman Street.—Several drugs, including large pod of musk and root of sarsaparilla.

MANDER, WEAVER, & Co., Wolverhampton.—Red precipitate, calomel, etc.

MOORE, Leicester.—Plasters, spread and unspread.

MORSON & SON, Southampton Row.—Collection of opiums, scammonies, and other drugs, and a large number of chemical preparations used in medicine.

G. S. PEDLER, Fleet Street.—Australian sassafras bark and its tincture.

PRESTON & SONS, Smithfield Bars.—Essential oils, including oil of bitter almonds, crude and purified from prussic acid, and numerous drugs.

ROUSE & Co., Wigmore Street.—Tinctures, liquors, etc.

SQUIRE, Oxford Street.—Extracts, liquors, tinctures, syrups, etc.

J. WATTS & Co., Edgware Road.—Extracts, vinegars, syrups, etc.

A. WAUGH, Regent Street.—Syrups and sealed preparations of iron.

E. WHITLOCK, Salisbury.—Chemical preparations.

W. WILKINSON, Manchester.—Syrups, oxymels, tinctures, liquors, cantharidine, etc.

YORK GLASS COMPANY.—Displacement and other apparatus for use in pharmacy.

H. GILBERTSON, Ludgate Hill.—Poison and lotion bottles.

The number of contributors to this collection is far greater than that of all the other contributors of pharmaceutical products to the British department of the Exhibition, and the articles contributed are also more numerous and varied. We do not propose, for obvious reasons, to offer any criticisms here on the specimens in this collection, although we may perhaps allude to them in subsequent articles. They are placed before the public, in charge of an attendant by whom every facility is afforded for their examination, and we are glad to find that many visitors, especially foreigners, avail themselves of the opportunity thus offered.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *4th June*, 1862,

Present—Messrs. Bird, Bottle, Davenport, Deane, Geo. Edwards, Hanbury, Haselden, Herring, Hills, Leseher, Meggeson, Morson, Savage, Sandford, Squire, Standring, and Waugh,—being the first meeting after the anniversary—the following Offieers of the Soeiety were eleeted:—

PETER SQUIRE .....*President.*
GEORGE WEBB SANDFORD .....*Vice-President.*
DANIEL BELL HANBURY .....*Treasurer.*
ELIAS BREMRIDGE .....*Secretary and Registrar.*

The following were appointed on the several Committees:—

General.—Messrs. Bird, Bueklee, Davenport, Deane, Leseher, Hanbury, Haselden, Herring, Hills, Meggeson, Morson, and Waugh.

Finance and Journal Finance.—Messrs. Bird, Bucklee, Hills, Leseher, and Meggeson.

Library, Museum, Laboratory, and House.—Messrs. Bird, Davenport, Deane, Geo. Edwards, Haselden, Hills, Leseher, Meggeson, Morson, and Waugh.

Board of Examiners (London).—Messrs. A Bird, Craeknell, Davenport, Darby, Deane, Garle, J. B. Edwards, Hanbury, and Morson.

Board of Exminers (Edinburgh).—Messrs Aitken, Blanshard, D. R. Brown, Flockhart, Tait, Gardner, Kemp, Ainslie, and Maekay.

The President and Viee-President, *ex officio*, on all Committees, and on the respeetive Boards of Examiners, London and Edinburgh.

The names of Members returned, nominated as loeal Seeretaries, were submitted to the Counеil for approval, the appointments eonfirmed, and the list was ordered to be published in the July number of the Journal.

SPECIAL COUNCIL, *June 20th*, 1862.

Present—Messrs. Bird, Bottle, J. B. Edwards, Hills, Leseher, Morson, Sandford, Savage, Squire, and Waugh.

The Report of the Committee appointed to eonsider the future management of the Laboratory was reeeived and adopted, and it was ordered that an advertisement for a Direetor of the Laboratory and an Assistant should be inserted in the leading periodieals, and on the second page of this Journal.

LIST OF MEMBERS, ASSOCIATES, AND APPRENTICES (*continued*).

Elected in June.

LONDON .....Bourdas, Isaiah
MAIDENHEAD .....Thompson, Charles Henry
NEWMARKET .....Bell, William
NOTTINGHAM .....Jenkins, Joseph

MAJOR EXAMINATION.

Chessall, Rowland .....Hoxton.
Hodder, Alfred .....Bristol.
Holgate, Walter .....Liverpool.

MINOR EXAMINATION.

Gowland, William .....Sunderland.
Heathorn, Alfred.....Reading.
Eminson, John Milton Oxley.....Gainsborough.
Davis, Frank Pratt .....Newbury.
Umney, Charles .....Bedford

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Autton, John Rydon	Mr. Hall	Haverstock Hill.
Donkin, James Ewbank	Mr. Nicholson	Sunderland.
Hankin, Frederick	Mr. Horncastle	London.
Mathews, John Hitchcock	Mr. Bluett	Reading.
Moore, George James	Mr. Stroud	Bristol.
Sykes, Edwin John	Mr. Greaves	Bakewell.
Taylor, Henry Aylton	Mr. Taylor	Middlesborough.

PHARMACEUTICAL MEETING, EDINBURGH.

CONVERSAZIONE BY THE PRESIDENT AND COUNCIL OF THE SOCIETY, IN THE GALLERIES OF THE INDUSTRIAL MUSEUM IN EDINBURGH.

Through the kindness of Professor Archer, the various rooms forming the temporary Industrial Museum were placed at the disposal of the Pharmaceutical Society for one evening; and advantage was taken by the President and Council to issue invitations to the different members and their friends to attend a conversazione. The meeting took place on the evening of Tuesday, April 29, and was very numerously attended by nearly four hundred ladies and gentlemen. After the reception of the visitors Professor Archer accompanied them round the departments of Science and Art, giving short, but interesting and instructive expositions, which were listened to most attentively. The following will give some idea of the classification, the Museum being divided into thirteen rooms, arranged as follows:—

No. 1.—Entrance Hall divided into two sections:—1.—Objects illustrating the operations in collieries and stone quarries. 2.—Miscellaneous objects, chiefly arms, basket-work, etc.

No. 2 contains illustrations of the processes of mining and metallurgy, including models of a German copper and lead mine, a blast furnace, steel furnace, etc., rolling-mills, tilt-hammers, etc.

No. 3 contains constructive materials in wood, stone, clay, slate, etc., amongst which are many illustrations of Dutch building materials.

No. 4 contains a fine collection of models of agricultural machines and implements presented by the Highland and Agricultural Society.

No. 5 contains manufactures in metal, chiefly selected for the purpose of illustrating the various processes employed in the manufacture of various useful articles. The illustrations of electro-metallurgy are especially fine, including Bell's 'Daughter of Eve;' the Maximilian casket by Elkington; Michael Angelo's 'Holy Dead,' 'Real Fruit,' etc., by Ratcliffe & Co.; a superb vase wine-cooler by Cartwright and Woodward.

No. 6 contains illustrations of pottery and glass, and the processes of making them.

No. 7 contains chiefly articles of clothing and personal ornament,—Indian, Japanese, Chinese, New Zealand, Fiji Islands, Western and Southern African, North American Indian, Esquimaux, and Icelandic. Also a very beautiful collection, illustrating the trade of Bedfordshire in ladies' bonnets, collected by Mr. A. J. Tansley, of Luton, and a series illustrating the manufacture of a gentleman's hat.

No. 8 contains the textile and other materials for clothing, etc., from the raw materials to the finished fabrics of wool, cotton, flax, hemp, etc., together with illustrations of calico-printing, the preparation of skins for furs, leather, etc.; also the use of bristles, etc., in brush-making, and of horn for comb-making.

No. 9 contains a miscellaneous collection, chiefly illustrating the decorative arts of different countries applied to the ordinary wants of life. They may be described as ornamental and useful applications of shells, bone, ivory, tortoise-shell, whalebone, horn, coral, fish-scales, insects' wings, seeds of plants, india-rubber, gutta-percha, carvings in wood and stone, lac and lacquer-work, wood inlaying, etc., adaptations of gourds, calabashes, etc.

No. 10 contains the materials used for food, medicine, perfumery, dyeing, tanning, the oils, gums, etc.

No. 11 is in two sections:—One is devoted to the paper manufacture and the applications of paper; the other to educational appliances, philosophical instruments, etc.

No. 12 contains a collection of chemicals, and illustrations of the most interesting chemical processes.

No. 13, at present unfinished, will, when complete, contain a collection of the tools and implements used by artisans, and machines and models of machines employed in manufacturing operations, etc.

At the close of the Professor's remarks a vote of thanks, in the name of the Society and those present, was tendered by the President, Mr. Aitken, to Professor Archer for his kind attention, as well as for his lucid and interesting descriptions. A band of music was in attendance throughout the evening, and played with considerable taste. The meeting separated shortly after ten o'clock.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fourteenth General Meeting was held at the Royal Institution, May 1, 1862; Mr. J. Shaw, Vice-President, in the chair.

The following donations were announced:—To the Library:—'The Proceedings of the Historic Society of Lancashire and Cheshire, for the Session of 1860-1,' from the Historic Society; the 'Pharmaceutical Journal' for May, from the Pharmaceutical Society; and the 'Technologist' for May, from the Editor. To the Museum:—Specimens of Sugar of Milk, Solazzi Juice, Corigliano Juice, and Baracco Juice, from Messrs. Clay and Abraham; Specimen of Lump Arsenic, from Messrs. Johnson, and of Metallic Arsenic, from Mr. N. Mercer.

The thanks of the meeting were given to the various donors. Several miscellaneous communications having been made, the paper for the evening, "On Electro-Plating," was read by Mr. H. Hutchinson.

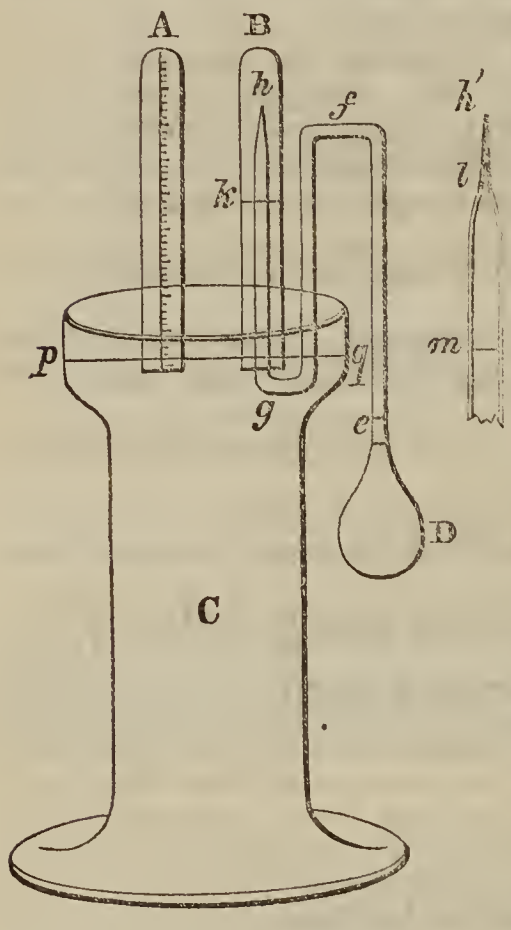
The Fifteenth General Meeting was held at the Royal Institution, May 15, 1862; the President in the chair.

The minutes of the last meeting were read; Mr. F. Robinson was elected a member of the Association.

Mr. J. C. Thompson presented to the Museum two fine specimens of Sugar of Milk, in large crystalline masses.

The Chairman exhibited a sample of the butter on which he had reported to the Health Committee; it contained sixty per cent. of mutton fat, and was coloured with palm oil. The sample had lost its original bright yellow colour, and both its taste and smell were extremely bad.

Professor Hamilton, F.C.S., introduced to the meeting a "Gas Transferrer, or Siphon" he had designed, and found useful in transferring small quantities of gas for accurate measurement. Its construction and mode of use will be readily understood by reference to the annexed sketch.



A is the graduated tube, into which the gas is to be transferred and measured.

B is the tube containing the gas in the space of B*k*, a portion of which is to be removed.

C the vertical pneumatic trough or cistern containing water or mercury, in which the tubes A and B are supported by tube-holders.

D an elastic indiarubber ball, to which is attached the bent glass tube, *e*, *f*, *g*, *h*, terminating in a capillary point, *h*.

In order to fill the siphon, D, *e*, *f*, *g*, *h*, completely with the liquid of the cistern, depress it until the point *h* is below the level of the liquid, *p*, *q*. Now press the bell, D, to discharge the contained air through *h*. Allow time for the liquid to pass back through *h*, *g*, *f*, *e* into D, and again press the ball, and so on, until no more air is discharged through *h* on pressing D. The siphon is then full of the liquid from the cistern.

To remove a portion of the gas from B, raise the siphon, until the part *g h* is brought into the position shown in the figure. Now press D, to discharge the contained liquid through *h*. On removing the pressure, a portion of the gas, equal in volume to the liquid discharged, will enter the tube. Depress the siphon until *h* is below the level of the liquid, *k*; immediately a small portion of the liquid will enter the capillary termination, *h*, and serve as a stopper to confine the gas, as shown at *h' l*.

The siphon may now be removed, and carried to any part of the laboratory, as the gas is confined between *l* and *m*.

In order to transfer the gas to the tube A, for measurement, introduce the limb, *g*, *h*, and gently press D; the little plug of liquid, *h' l*, is forced out, and the gas follows in such a manner that the minutest quantity can be introduced, and measured on the scale.

Mr. A. Norman Tate, F.C.S., read an interesting paper "On the Manufacture of Caustic Soda," illustrated by diagrams and specimens; at the conclusion of the paper, some discussion took place on various points mentioned in it.

The proceedings of the meeting were brought to a close by a vote of thanks to Professor Hamilton, Mr. Tate, and Mr. Thompson.

The Sixteenth and last General Meeting for the Session was held at the Royal Institution, May 29, 1862; the Vice-President in the chair.

The Secretary read the minutes of last meeting, and announced the donation of Archer's 'Vegetable Products of the World,' from Mr. N. Mercer.

The Secretary drew the attention of the meeting to the prizes offered by th Council through the liberality of the President, viz., one of £2. 2*s*. for the best collections of Crystals, consisting of not less than twelve specimens of Salts, etc., se-

lected from the list of twenty-six; and another of £3. 3*s*. for the best collection of Microscopical Objects. He pointed out the nature of the regulations under which the prizes were offered, and expressed a hope that the number of competitors would be large, and the quality of the collections such as to reflect credit on both the individual competitors and the Association.

Mr. H. S. Evans exhibited one of Smith and Beck's Binocular Microscopes, and described the peculiar properties of the instrument, as well as the various unsuccessful attempts that had, from time to time, been made to secure the same results by other means.

Dr. J. B. Nevins introduced to the notice of the meeting a powder which he had used with great success for the destruction of cockroaches and crickets. Having sprinkled a handful of the powder on the floor of his kitchen overnight, he next morning found between four and five hundred cockroaches either dead or dying. The powder had been given to him by an Italian friend (who procured it from Dalmatia), and consisted of the flower-heads of the *Chrysanthemum Leucanthemum*, or Oxeye Daisy, dried and rubbed into a coarse powder. Perhaps some member of the Society would ascertain whether the plant grown in this country was equally efficacious in destroying cockroaches and other insects.

Dr. Macintyre drew attention to the danger of labelling boxes of pills or bottles of medicine—"The pills as before," or "The mixture as before;" and said he had found in the room of one of his patients two boxes of pills so labelled, and laid on the table side by side, one box containing strong opium pills, and the other rhubarb pills.

Mr. Redford said the subject had been mentioned on several occasions, and he thought the labels in question were never used in respectable establishments.

The Chairman and other members agreed with Dr. Macintyre as to the impropriety and danger of using such labels, and the duty of those who dispense medicine, to affix the full direction to every bottle, box, or other package, however often repeated.

DETECTION OF HYDROCYANIC ACID.

Mr. Martin Murphy briefly referred to certain precautions which should be observed in the detection of hydrocyanic acid in toxicological examinations, when using what is known as the "sulphur test" for this acid. He stated that when the contents of the stomach, or the tissue of this organ, or of the intestines are submitted to distillation in the usual manner for the purpose of eliminating the hydrocyanic acid, acetic acid invariably passed over into the receiver, producing an acetate of ammonia by the decomposition of the sulphide of ammonium in which the distillate is received. The acetate of ammonia thus formed yields with sesquichloride of iron a blood-red coloration, which cannot be distinguished by its shade from the red colour of the sulphocyanide of iron; hence it was necessary to be careful that the former was not taken for the latter. Notwithstanding the volatility of neutral acetate of ammonia at the temperature of 212°, still, when an excess of sulphide of ammonium is present, the acetate becomes more fixed, and produces the coloration referred to, even when all the acetate might be supposed to have been dissipated. In order to guard against such an occurrence, he suggested that the sulphide of ammonium employed as the condensing medium be as nearly as possible neutralized by acetic acid, and the evaporation of the liquid carried to *perfect dryness* before the iron test is applied, or that a drop of strong nitric acid be let fall upon the dry residue. In the former case the deep red of the sulphocyanide of iron, and in the latter, a fading pinkish-red make their appearance if the least trace of hydrocyanic acid exists in the substance under examination.

Mr. J. Sherlock read a short paper "On the Extraction of Ammonia from Gas Refuse."

The Chairman briefly congratulated the Members on the success of the session just closing, the number of members having been greater, and the attendance at the meetings better than in any previous session. He was also glad to hear from the Librarian that the valuable Library and Museum of the Association were used by the Members to a much greater extent now than ever before, since their formation.

The Secretary thought that they should not separate without expressing their high opinion of the manner in which their esteemed President had discharged the

duties of his office, and in every possible way studied to promote the best interests of the Association during the session. His election to the Presidency for the third time, at their last Annual Meeting, was of itself a high testimonial to his worth, and their anxiety to retain his services as President showed the value they set upon those of previous years. The nature and importance of those services were well known to every Member of the Association, and he was sure they all deeply sympathized with him in the affliction which prevented him from being amongst them that evening. Mr. Walker concluded his remarks by moving the following resolution, which was passed by acclamation:—

"That the best thanks of the Liverpool Chemists' Association be given to Dr. Edwards for his valuable services as President during the present session, and that the Members present desire to express their sympathy with him in the loss which he has just sustained by the death of his father."

A vote of thanks to the Chairman closed the proceedings.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG.

(*Continued from Vol. III. p.* 546.)

III. XANTHORRHIZA APIIFOLIA, *WILLD.*—YELLOW-ROOT.

History.—The root of this plant has been long employed by the inhabitants of the southern and western parts of North America as a tonic. It was introduced at an early period into the Secondary List of the Materia Medica in the United States Pharmacopœia, in which list it may be found at the present day. It has, however, never been in much repute with the regular medical practitioners in North America, and hence the United States Pharmacopœia contains no formulæ for any preparations of it; neither has it found favour with the class of Eclectic practitioners. Nevertheless, it possesses well-marked tonic properties, and is worthy of a trial in this country, and, as our papers upon New American Remedies would be incomplete without a notice of it, we propose in this communication to give a brief description of its botanical and other characteristics. Besides its use in medicine, the root has been employed from the earliest periods by the Indians of the southern parts of North America, as a yellow dyeing agent.

Synonyms.—This plant is the *Xanthorhiza* or *Zanthorhiza apiifolia* of Marsh; Sprengel, 1154; Hérit. 79. t. 38; *DC. Prod.* i. 65; and *DC. Syst.* i. 386. It is the *Xanthorrhiza apiifolia* of Willd. *Spec. Plant.* i. 1568, and Barton's *Med. Bot.* vol. ii. 203; the *Xanthorrhiza simplicissima*, Pursh, and the *Xanthorrhiza tinctoria*, Woodhouse, *N. Y. Med. Rep.* vol. v. The name by which it is known in the United States Pharmacopœia is *Xanthorrhiza apiifolia*, and as it is only officinal in that Pharmacopœia, we consider it advisable to adopt the name there employed. Its common name is Yellow-Root, a term derived from the colour of its root. The generic term *Xanthorrhiza* is also derived from two Greek words, *ξανθος* yellow, and *ῥιζα* a root. This *yellow-root* must not be confounded with the *yellow-root* described in our preceding notice of New American Remedies, which was obtained from the *Hydrastis canadensis*, Linn.

Botany.—*Xanthorrhiza apiifolia* belongs to the Natural Order Ranunculaceæ of Jussieu, De Candolle, Lindley, and most other botanists; and to the tribe Pæonieæ of De Candolle.

Generic Character.—*Sepals* 5, deciduous. *Petals* 5. *Carpels* 2-3-seeded, by abortion 1-seeded; *DC.*

Specific Character.—A small deciduous shrub, from 2 to 3 feet high. *Root* horizontal, throwing up numerous suckers. *Wood* bright yellow. *Leaves* pinnate, of about three pairs with an odd one; *leaflets* ovate or rhomboidal, slashed, and serrated, sometimes divided almost to the base on one side, pale green, smooth above, slightly pubescent beneath. *Racemes* axillary, pendulous. *Flowers* small, dull purplish-brown. *Petals* obovate, 2-lobed. *Ovaries* 5–9. *Capsules* inflated, compressed, 1-celled, 2-valved, opening at the apex. *Seeds* oval, flattened; *Lindl.*

Habitat.—*Xanthorrhiza apiifolia* is only found in a wild state in the mountainous parts of the interior of the Southern and Western States of North America. It is abundant on the banks of the Ohio. It flowers in April.

Collection.—It should be collected for use in medicine, and for other purposes, late in autumn or early in spring. The root is the most active part of the plant, and is that portion which is alone directed to be used in the United States Pharmacopœia; but the stem possesses identical properties with the root, although by no means to the same extent.

General Characteristics.—The part employed in medicine and for other purposes is a true root, and not a rhizome with attached rootlets, as we have seen to be the case with the so-called roots of *Podophyllum peltatum* and *Hydrastis canadensis*, described in our two previous communications.

The *root*, as found in commerce, presents a very irregular appearance, being commonly much twisted and knotted, and giving off at intervals branches of varying sizes. Sometimes a portion of the stem may be found attached to the root. In length the root varies from two or three to twelve or eighteen inches, or even in some cases pieces may be found of still greater length. In thickness it varies commonly, from the size of an ordinary knitting-needle to that of the little or ring finger. The root consists of a thin yellowish-brown cortical portion, enclosing a yellow woody axis or meditullium. The cortical part is readily separable from the meditullium, and hence we frequently find pieces of the root from which it is more or less removed. The surface of the cortex is smooth, with irregular longitudinal furrows. It may be separated into two evident layers, the external of which has a yellowish-brown, and the internal a deep yellow, colour.

When the cortical portion is removed, the meditullium presents a bright yellow colour externally; and when the pieces of root are of moderate size, the woody bundles project from the surface and produce a corresponding number of irregular, more or less twisted, longitudinal elevations. A transverse section of the meditullium presents an evident medulla or pith, which is most observable in the middling-sized pieces, and from which well-marked large medullary rays may be seen to radiate to the cortical portion. On the outside of the pith the true woody or vascular portion is seen to consist of a variable number, according to the size, of wedge-shaped radiating masses, which are separated from each other by the large medullary rays just alluded to. The large size of the medullary rays and their regular arrangement, frequently enables us to separate the different woody bundles from each other, and, in some commercial specimens, portions of the root may be found in which these parts are thus separated. The general colour of the meditullium is yellow. The fracture is short, irregular, and more or less fibrous. The dried root has no very evident odour, but it has a pure intense bitter taste, resembling

quassia or calumba. This bitterness is much more marked in the cortical portion than in the meditullium. From the greater bitterness of this part, and also from some of its chemical characteristics, we have no doubt but that it is the most active portion of the root. Hence, when the root is required for medicinal purposes, those pieces should be selected which are of moderate size, as in such specimens the bark is in greater proportion to the meditullium, than in the smaller or larger pieces of root.

Composition and Chemical Characteristics.—No complete analysis of the root of *Xanthorrhiza apiifolia* has been published. The most interesting point yet noticed with regard to it, is the discovery in it of *berberine* by Mr. Perrins.* It is remarkable, as noticed in our paper on *Hydrastis canadensis*,† that *berberine* has now been found in plants belonging to no less than four Natural Orders; that is, in *Berberis vulgaris* (Berberidaceæ); *Cocculus palmatus*, or *Jateorhiza palmata*, and *Coscinium* or *Menispermum fenestratum*,‡ of the Menispermaceæ; in *Cœlocline* or *Unona polycarpa*, of the Anonaceæ; and in *Hydrastis canadensis*§ and *Xanthorrhiza apiifolia*, as just noticed, of the Ranunculaceæ.

An infusion of the root, made by macerating one ounce, in a bruised condition, in twenty-four ounces of boiling water, for twenty-four hours, presented a light yellow colour resembling that of ordinary pale sherry, a peculiar, somewhat oily smell, and a pure, strong, bitter taste. It exhibited also the following reactions:—*Blue litmus paper* was reddened by it; *solution of diacetate of lead* produced a copious dirty-white precipitate; *solutions of the perchloride* and *persulphate of iron*, a brownish-black colour, but no precipitate; *tincture of iodine* caused a dirty reddish-brown precipitate; *solutions of sulphate of copper* and *chloride of barium* produced no change; *solution of ammonia* changed the colour to a slight reddish-brown; *infusion of galls* produced an evident precipitate; *solution of gelatine* caused scarcely any perceptible precipitate; and no very evident effects were produced by the application of either *sulphuric*, *nitric*, or *hydrochloric* acids.

The effects produced by the application of the concentrated acids to a clean section of the root were however very marked. That of *sulphuric acid* caused a general blackish-brown coloration, which was however most evident in the cortical portion and woody wedge-shaped plates; that of *hydrochloric acid* deepened the colour of the cortical portion to a reddish-brown, but the general yellow colour, independently of the bark, was rendered somewhat less intense than before; that of *nitric acid* produced a deep reddish-brown colour upon the whole surface of the section except the medulla, but the change of colour was most evident in the cortical portion.

Medicinal Properties, Uses, Preparations, and Doses.—As already noticed, it has an intense, pure bitter taste, resembling quassia and calumba. It may be employed therefore in the same manner, and in all cases where a pure tonic bitter is indicated. Dr. Woodhouse‖ "employed it in the dose of two scruples, and found it to lie easily upon the stomach." Similar preparations may be prepared from it as ordered for quassia and calumba; the infusion and tincture would probably be found the most active and elegant. The root, as already noticed, has been used for the preparation of a yellow dye.

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* Pharm. Journ. vol. iii., 2nd ser., p. 567.

† Id. p. 544. ‡ Pharm. Journ. vol. xii. p. 188.

§ Silliman's Amer. Journ., Jan. 1862; Amer. Journ. Pharm. vol. xxxiv. p. 104; and Pharm. Journ. vol. iii. 2nd ser., p. 544.

‖ Wood and Bache's 'United States Dispensatory,' 11th edit., p. 799.

USE OF METHYLATED SPIRIT IN PHARMACY.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—The Annual Meeting has been held; the Council have met their constituents, who have expressed their opinions upon the Journal, the Benevolent Fund, and the Patent Medicine License. I have looked for some allusions to a matter affecting our trade more than any of these. I say our *trade*, instead of adopting the term *profession* in this place, because the subject is a trade question, and I think further that it is the province of the Pharmaceutical Society to consider all such. As the question of Methylated Spirit was not broached at the anniversary, I avail myself of your columns as the best method of calling attention to it, and advisedly prefer this course instead of bringing it directly before the Council. The question wants ventilating, and if the Members of the Society will exchange notes of their personal experience, I believe that we shall wonder at its having slept so long. I allude to the use of *purified*, or "cleaned," methylated spirit in pharmacy, and assert that the extent of this use is now enormous and increasing.

Now your pages have not, as far as I know, ever hinted at such an operation being practised as the removal of the naphtha added by the Excise. The Report of the Government Commissioners—Profs. Graham, Hofmann, and Redwood—stated that this purification could not be accomplished, and the Excise chemist, Mr. G. Phillips, has subsequently made similar statements. The interval of nearly seven years since the first-named report has not unnaturally produced some change, and it is time that we should carefully consider the present position of the case.

I will state certain facts as a starting point, viz.:—First, that methylated spirit is "cleaned" and substituted for duty-paid spirit without being detected. I have seen an article which I could not distinguish from duty-paid spirit, which had the faintest blush of pink colour, and which had been sold to a surgeon under the name of "Tincture of Cochineal," at 12*s*. per gallon. He had also been supplied with various tinctures made from similar spirit, at one-half the cost of the ordinary ones. These tinctures were not distinguishable from pure ones.

Secondly, I have now before me a specimen of "cleaned" methylated spirit having the following origin. It was purified by the person in Manchester who has originated the trade, mixed by him with a little ammonia, and sold under the name of "Spirit of Ammonia." The buyer neutralized the volatile alkali, and re-distilled it, obtaining a fairly pure spirit, which is being substituted for duty-paid spirit at full prices.

Thirdly, it has for a length of time been the practice for "'cute" druggists to send to Manchester casks and carboys with a portion of some crude drug, as camphor, rhubarb, etc., in order that the rectifier previously alluded to may fill them up with the "cleaned" spirit. Although this is quite a matter of notoriety in some districts, there are many who will doubtless now hear of it for the first time. The parties concerned assert that they have the sanction of the Excise, and as far as the present is concerned, I believe this to be so.

What our trade may think on the subject is the real question; and if the fair traders will only combine, the injustice they are suffering is so flagrant that the Excise cannot long permit the abuse.

It has been said that some of our London brethren have inquired through the West End for methylated tinctures, and because they did not find them have ignored their existence. Why not try Mile End?

Fourthly, "cleaned" spirit has been offered to our firm within the week at

7*s.* per gallon, and although not seeing it, I am told that the sample was practically pure. I know that other works are about to be opened.

Having stated my premises, the conclusions to be drawn are more brief, and so simple as to be self-evident.

The Excise demands from us a heavy duty on the article which is most essential to us. Our neighbour evades this duty, pockets nearly its amount, and undersells us, thus getting our customers for other articles. The College of Physicians of London have expressly forbidden the use of the methylated spirit, and the Excise only permit the transmission of the "cleaned" spirit under evasions to which honourable men cannot stoop.

The temptation to fraud is enormous in this margin of the duty. It is well known that a considerable falling off in the spirit duties was one of the announcements of the late budget. The question I wish to adhere to is strictly that of the connection between Methylated Spirit and Pharmacy. Of its benefits to other trades let others speak.

An historical notice of considerable interest may be culled from your pages, and if you can permit space for the abstract of this, it may aid a systematic view of the case.

Pharm. Journ. Vol. XIV. p. 556, contains report by Professors Graham, Hofmann, and Redwood (June, 1855), recommending the sale of spirit duty-free when mixed with naphtha and shellac.

Vol. XV. p. 28. Mr. Wood, Chairman of the Board of Inland Revenue, and the originator of the scheme, states again their requirements, and asks why the Commissioners prefer purified to crude naphtha. They reply that the oils of the latter are objectionable, and are so easily removed by potash as to form no protection.

P. 138. Abstract of the Act for Regulating the Sale, etc., of Methylated Spirit.

P. 310. Mr. Macfarlan's lecture; shows advantages to many trades. With regard to pharmacy, all his allusions assume the *conversion* into ether, chloroform, etc.

Vol. XVI. p. 406. Macfarlan's concluding lecture. Meth. Sp. Æther. Nitr.

Vol. XVII. p. 264. Pharm. Meeting, Oct. 14, 1856; Jacob Bell, chairman. Dr. Edwards exhibited methylated tinctures. Mr. Morson read a circular from a person offering them at one-third ordinary prices "for veterinary purposes." The chairman said, that the naphtha was so predominant that he should not have recognized them for what they represented.

P. 303. Pharm. Meeting, Nov. 4, 1857. The subject fully discussed. It arose from an order for methylated soap liniment for the army sent to Apothecaries' Hall. Dr. Redwood treated the subject at length and with peculiar acumen. He divided its pharmaceutic uses into, firstly, as a solvent for extraction; secondly, as a vehicle for the administration of medicines. For the first purpose he thought it unobjectionable, to the second there were very grave objections. "He was decidedly of opinion that methylated spirit ought not to be used for the preparation of medicines of which it would remain a component part. If its use was admitted in any special cases, it would gradually come to be used in others, and thus, by admitting the thin end of the wedge, it would become a cause of scandal to the pharmaceutical body and a source of embarrassment to the medical profession. He thought the Board of Inland Revenue had made a mistake in allowing methylated spirit to be used for making sweet spirit of nitre, and that the Government had committed a still greater error in sanctioning its use in medicines supplied to the army. . . . He thought the subject deserved the serious attention of the Pharmaceutical Society, and he trusted the agitation of it

would not be allowed to subside until the questions at issue were satisfactorily disposed of."

Mr. Squire expressed his concurrence. It was decided to submit the question to the College of Physicians.

Vol. XVII. p. 355. Minute of College of Physicians, Nov. 25, 1857, disapproving its use. Also minute addressed to the Inland Revenue notifying the same.

P. 344. Copy of permission, Sept. 20, 1857, from Board of Inland Revenue to a person in Edinburgh to receive methylated spirit "to be used in making varnishes and medical tinctures and extracts."

P. 398. Reply of Inland Revenue, Dec. 3, 1857, to College of Physicians. They offer to withdraw permission for its use for tinctures and extracts, but inquire if College objects to its use for *all* preparations in the Pharmacopœia. The Censors reply in six resolutions, concluded thus, "that consequently the substitution of methylated for rectified spirit in *any* of the processes of the Pharmacopœia be strictly prohibited."

P. 412. Macfarlan corresponds with the Excise, who employ Mr. G. Phillips to report whether a potable spirit can be derived from the methylated. He concludes that it cannot. Experiments detailed. Macfarlan still keeps to question of conversion into ether, etc.

Vol. XVIII. No allusions.

Ser. 2, Vol. I. Ditto.

Ser. 2, Vol. II. Ditto.

Ser. 2, Vol. III. p. 486. Correspondence between Registrar of College of Physicians of Ireland and the Cork Medical Association. In both letters the medical use of the spirit is highly reprehended.

The cases of the chemists at Birmingham who were fined for selling the spirit mixed with peppermint for the purpose of drinking, shows that abuses have now developed. More information is desirable about these than has been made public.

I believe, Gentlemen, that the time has come when we must purge ourselves from this morbid influence. It saps commercial morality; and although the persons whose talents first found a fitting field in developing the system are "of the baser sort," still men of more principle will be rapidly drawn into the vortex, and confidence and purity be wrecked together.

I trust that upon this point the country members will be heard, for the question affects them in the first instance. When we understand each other's feelings, the action to be taken may be decided. There is reason to believe that strong pressure will be required to influence the Excise, but this is only a reason for more earnest exertion.

It will give me great pleasure to correspond privately with any gentleman upon the subject, and I should much esteem the favour of information from any district.

I am, Gentlemen, yours respectfully,

R. Reynolds.

13, *Briggate, Leeds, June* 20, 1862.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As there seems to be some misconception with respect to the sale and use of Methylated Spirit, it may not be altogether uninteresting if I endeavour to recall as briefly as possible some particulars in connection with it; and, with a view to show that the Inland Revenue themselves are not free from blame, I will give the copy of a letter which appears in answer to a correspondent in the December number of the Journal, 1857.

"Inland Revenue Office, London, 20th Sept., 1857.

"Sir,—In reply to your application, dated the 12th inst., I am directed to convey to you the Board's authority for receiving methylated spirit to be used in making varnishes and *Medical Tinctures and Extracts.*"

This application of methylated spirit was not anticipated, and the College of Physicians, impressed with the important bearing it was likely to have on the profession, addressed a protest to the Inland Revenue department, wherein they say, their "attention has been called to the unauthorized departure from the instructions of the Pharmacopœia in the manufacture of tinctures and other preparations," etc. etc., at the same time issuing the following caution :—

"Royal College of Physicians, Nov. 25th, 1857.

"The Censors of the Royal College of Physicians, having learned that in the manufacture of Tinctures and some other preparations of the Pharmacopœia, it has lately become the practice of certain druggists and manufacturers to use *methylated* in the place of *pure* spirit, hereby declare their disapproval of such an unauthorized departure from the instructions laid down in the Pharmacopœia."

The Inland Revenue Office, in reply, dated Dec. 3rd, 1857, say, that in consequence of the above communication, they are prepared to withdraw permissions already in force, and to withhold their consent from any future application, for the use of methylated spirit for medical tinctures and extracts, and they ask the College of Physicians if it is desirable to prohibit its use for all L. P. preparations. To this, the Pharmacopœia Committee of the College of Physicians answer, "that the substitution of *methylated* for *rectified spirit*, in *any* of the processes of the Pharmacopœia, should be strictly prohibited." From a minute of the Inland Revenue Office, dated Feb. 5th, 1858, I make the following extract :—"Very erroneous views of the powers and intentions of this department appear to prevail, and it is necessary that the Commissioners should distinctly warn all persons using methylated spirits in medicinal preparations, or in any manner not sanctioned by the Colleges of Physicians" (the Edinburgh and Dublin having concurred with the London). Notwithstanding these prohibitions, large quantities of methylated spirit have been used, and are being used now, for pharmaceutical preparations, to the injury of the fair trader; and every respectable druggist must regret the encouragement given to this illicit trade by public hospitals and dispensaries. For the information of such of the trade as have not seen the particulars, I call their attention to the following facts :—

On the 5th ult., several respectable chemists and druggists at Birmingham were summoned, at the instance of the Inland Revenue officers, for selling methylated spirit without a license, for which they were liable to a penalty of £50, and, having at the request of the purchasers mixed essence of peppermint with the methylated spirit (thereby making it in the eye of the law a beverage), had incurred a further penalty of £100. However, as it was considered that the vendors erred in ignorance, and sold methylated spirit instead of finish, and having pleaded guilty, were each fined in the lowest penalty of £10. 10*s*.

By a recent Act of Parliament a license, which costs £2. 2*s*. per annum, may be obtained for legalizing the sale of methylated spirit, and the Inland Revenue department have given instructions to their officers in diffierent parts of the country to call upon chemists and druggists, to ascertain by a very simple test (*i. e.* by mixing one part of the spirit with three parts of water) whether it is methylated spirit or finish they sell; it therefore behoves the trade to see that the wholesale house sends them finish when that article is ordered, or, in the event of selling the unmixed spirit, to take out the necessary license.

I fear that I have trespassed too much on your space; but if you think the subject of sufficient importance and can find room for it, you will oblige, Sir, yours respectfully, W. D. Savage.

ON THE EXAMINATION OF COMMERCIAL SULPHATE OF QUININE FOR OTHER ALKALOIDS FOUND IN THE CINCHONA BARKS.

BY DR. G. KERNER.

In most of the Pharmacopœias and Chemical Manuals we find the well-known ether-test recommended for the recognition of cinchonine and quinidine, in commercial sulphate of quinine. This test consists in treating six grains of the sulphate in question with from sixty to seventy drops (= 2 c. c.) of ether in a well-stoppered test cylinder, to which six drops of liquor ammoniæ are added, and in well shaking the mixture. The fluid separates into two layers, a clear aqueous and an ethereal one. The upper layer should not deposit an amorphous or crystalline mass, either immediately, or in the course of a few hours. This method suffices in most cases, for it indicates even minute traces of an admixture of cinchonine and of the ordinary quinidine. It indicates clearly one-half to three-quarters per cent.; or if an ether which has been previously saturated with quinidine be employed, even smaller quantities of the latter alkaloid. I have however frequently found in my experiments, that ether cannot implicitly be relied on, or recommended as a safe means of separating the bases of the cinchona barks. The ether test itself exhibits irregularities which render the observation of the reaction a matter of uncertainty. The ethereal solution frequently solidifies to a gelatinous mass, which at times is perfectly clear and transparent, sometimes traversed by net-like layers of enclosed air, which impart to it a crystalline appearance, and give rise to errors, since they render it exceedingly difficult to distinguish whether crystals of quinidine have separated from the ethereal solution or not. It is probable that the cause of the formation of this magma will be explained best by viewing it as a double salt of the quinine salt with the ammonium salt formed in the reaction, since I was able to trace in the gelatinous mass almost invariably sulphuric acid and a salt of ammonium, not met with in the ethereal solution when the reaction went on properly. It was not however this, for the most part accidental occurrence, which vitiated the ether-test, but the circumstance which my experiments brought to light, —that there are alkaloids in the cinchona barks, which, although isomeric, and partly also isomorphous with the ordinary quinidine, still exhibit many abnormal chemical properties, amongst which I may especially mention a very different (far greater) degree of solubility in ether. I made experiments with the sulphates of these quinidine bases which were more soluble in ether, and found that from ten to twenty per cent. of these salts could be mixed with the pure sulphate of quinine without being detected by the ether-test; and it is to be feared, that manufacturers may make use of this property of the new alkaloids, to enable them to sell under the protection of the ether-test an inferior sulphate of quinine mixed with other cheaper sulphates. Now it would be quite possible to detect an extensive adulteration, when once known, by other means (ex. gr. by treating the alkaloids precipitated from the mixed sulphates with spirits of wine of 20° Beaumé); but it would be exceedingly difficult, nay, even impossible, qualitatively to detect, by means of this test, smaller unintentional adulterations (impurities). I therefore set to work to find out a quinine test which would be both accurate and easy of execution.

and by which it would be possible to detect even very small quantities of the above *new* bases.

Before I enter upon the description of the experiments made for this purpose, I may be permitted to give a short sketch of the characteristic properties of the cinchona alkaloids in general, on account of the confusion in their nomenclature which prevails among chemists. A few remarks on this subject may, therefore, be acceptable in this place. Chemists who have had an opportunity of studying the cinchona bases must have observed that quinine, cinchonine, quinidine, and cinchonidine are not the only bases found in the barks, but that frequently modifications of these principal bases are met with in the cinchona barks, which differ in many essential points from them. I believe, however, that all organic bases derived from the barks (whether known or not yet known), may be conveniently arranged in two distinct groups until science succeeds in unravelling the true constitution of these substances, viz. :—

I. Group.—Quinine and its isomerides, of the formula $C_{40}H_{24}N_2O_4+xHO$.

II. Group.—Cinchonine and its isomerides, of the formula $C_{40}H_{24}N_2O_2$.

This classification does not comprise some of the more obscure bases, whose formulæ require further confirmation before they can be accepted as forming part of Groups I. and II. of alkaloids, or whose derivation from cinchonas is doubtful (ex. gr. aricine, paricine, cinchovatine, pitoyine, blanchinine, Gruner's bases, etc.).

I. Group.—*The solutions of salts of these bases give, in every instance, the well-known reaction with chlorine water and ammonia. The pure alkaloids form hydrates, which effloresce readily.*

1. *Quinine* (forming crystallizable salts).—When pure it is generally amorphous, forms however two hydrates, with two and six equivalents of water. Besides many distinctive properties which its compounds with organic and inorganic acids possess, it is distinguished at once by a property which singles it out from among all the cinchona bases, viz., *the property of forming a crystallizable product of substitution with iodine*,—the highly interesting Herepathite. By the aid of the microscope Herepath's reaction enables us also to ascertain whether a commercial quinine salt contains, besides quinine, traces of other alkaloids, or crystallizable extractive matter (*salicine*, *phlorrhidzine*). This reaction requires, however, great practice.

2. *Quinoidine.*—An amorphous modification of the quinine, to which it stands probably in a similar relation to that of grape to cane sugar. If Pasteur's observation of a product of decomposition produced by the action of sulphuric acid upon quinine is at all correct, quinoidine invariably contains quinicine.

3. *Ordinary Quinidine* (*a* Quinidine).—The sulphate of quinidine most frequently (at least formerly) met with is the sulphate of *a* quinidine. It is of a very different solubility in cold water—from 1 part in 300 to 1 part in 180, *rarely more*. The pure alkaloid crystallizes from spirit in *large*, *short*, slowly effervescing, truncated prisms. Tepid ether dissolves mere traces of the base, which crystallize out on standing for a short time. Its presence in sulphate of quinine is, therefore, readily indicated by the ether-test. Many of its salts exhibit, when compared with the corresponding quinine salts, striking differences in form and solubility, and in the proportions in which they dissolve.

4. *β Quinidine.*—Crystallizes from spirit of wine in fine needles, which effloresce very rapidly, and is far more soluble in ether than the previous alkaloid. Its sulphate forms small brittle needles, and is more soluble in water than the sulphate of *a* quinidine (1 part in 110 to 1 in 98). It possesses the characteristic property of producing an amorphous precipitate with a concen-

trated solution of iodide of potassium (1 part in 4) in an aqueous solution saturated in the cold, whilst the same reagent produces oily or resinous deposits in aqueous solutions, saturated in the cold of all other cinchona bases, except that of sulphate of quinine. The other salts of β quinidine are more allied to the salts of quinine than those of α quinidine.

5. γ *Quinidine* is even more soluble in ether than the β quinidine; the solubility of its sulphate is on a par with that of the sulphate of α quinidine. From its appearance and specific gravity it cannot be distinguished from the pure sulphate of quinine, and iodide of potassium acts upon an aqueous solution saturated in the cold, in the same manner as it acts upon all other sulphates of the cinchona alkaloids, with the exception of sulphate of β quinidine.

The alkaloids 3, 4, and 5 of Group I. are only sparingly soluble in alcohol of 20° B.

II. Group.—*Solutions of salts of this group of bases exhibit no change of colour on the addition of chlorine water and ammonia. The pure alkaloids form no hydrates, but beautiful anhydrous crystals*, insoluble in ether, (or at all events far less soluble than the α quinidine,) and equally insoluble in alcohol of 20° B.

1. *Cinchonine* is easily distinguished from all the other cinchona bases by the crystalline form and properties of almost all its salts. Its bisulphate is the only cinchona substance which possesses distinct dichroism.

2. *Cinchonidine* (the ordinary), crystallizes from alcohol in hard prisms of a strikingly vitreous lustre. Its salts are generally less crystallizable than those of the bases of the first group and of cinchonine; with hydrochloric acid. however, it forms a very characteristic compound, crystallizing invariably in almost regular well-formed dense rhomboidal octahedra, (like nitrate of quinine), whilst all other hydrochlorates of the cinchona bases crystallize in long prismatic needles, often combined in fibrous masses, having the appearance of asbestos. By saturating cinchonidine with sulphuric acid, and comparatively little water, the solution solidifies on cooling, and after some standing leaves a curdy gelatinous magma. Commercial sulphate of cinchonidine is thus frequently found in coherent masses, resembling commercial carbonate of magnesia. The solubility of this compound in water of 15°C. lies between $\frac{1}{100}$ and $\frac{1}{95}$

3. It appears that there are modifications of cinchonidine, similar to those of the bases of Group I., which might be characterized as separate isomerides of cinchonine. A short time ago I obtained an alkaloid, crystallizing in brilliant little scales or small shining needles, from an amorphous sulphate of cinchonidine, which came from France, and was sold under the name of *Sulphate de Quinidine*. It dissolved in 108 parts of water of 15° C., and gave with hydrochloric acid long hard rhombic prisms and no rhomboidal octahedra.

In my endeavour to find out a qualitative quinine test, I thought first of employing the peculiar iodide of potassium reaction, described under β quinidine, with cold saturated solutions of the sulphates of the alkaloids, and succeeded in distinctly tracing, by means of this reagent, an adulteration amounting to as little as 0·3 per cent. of the sulphate of quinine with quinidine (especially with β quinidine); at the same time I perceived that a qualitative test, based upon the iodide reaction, could not be recommended as a mode of commercial analysis, because the precautions which have to be observed are manifold and difficult, and likely to give rise to erroneous observations. For, the hydriodate and the sulphate of quinine are almost equally soluble in cold water, and it is therefore possible that an aqueous solution of the sulphate saturated in the cold, of a perfectly pure quinine, is rendered slightly turbid on the addition of iodide of potassium, if the latter be a little too concentrated

or if one or the other of the solutions shows a different, *i. e.* a lower temperature than 15° C. Moreover, the iodide of potassium of commerce is rarely absolutely free from carbonate of potassa or caustic potassa, which renders the test troublesome for those who have first to prepare the perfectly neutral reagent. Sulphate of quinine, containing traces of free sulphuric acid, (in the case of its having been recrystallized from strongly acidulated water) is thereby rendered more soluble, and since all solutions of quinine salts, which are more soluble, are precipitated by iodide of potassium, the result of the test would in that case be faulty. In the presence of very slight traces of foreign alkaloids a large excess of the reagent frequently dissolves the precipitate as rapidly again.

Several years ago Howard proposed to employ the slight solubility of the sulphate of quinine in cold water as a criterion of its purity; but the solubility of even the purest sample varies, and is not at all constant, and this mode of testing might therefore, in some cases, cause the analyst to overlook from 2 to 5 per cent. of quinidine. Accurate determinations of the solubility of organic substances, containing water of crystallization, are not among the easiest of tasks of analytical chemistry, and the possession of a characteristic qualitative test becomes therefore a thing all the more to be desired. A method for the recognition of foreign cinchona bases in sulphate of quinine may, however, be based upon the difference in the solubility of the sulphates of our alkaloids, provided another factor of solubility is taken into account. Dilute solution of caustic ammonia exhibits very different solvent powers with the different cinchona alkaloids. Quinine is dissolved with comparative facility, α quinidine with much more difficulty, β and γ quinidine and cinchonidine only slightly, whilst cinchonine is all but perfectly insoluble in ammonia. The solubility of the cinchona bases, in ammonia, stands therefore in an inversed ratio to that of their sulphates in water. Upon this fact is based the following quinine test:—

A. *Solubility of the cinchona bases* in dilute ammonia.

The dried alkaloids, whether amorphous or crystalline, dissolve very difficultly and slowly, and rarely equally in ammonia; they do not even dissolve in constant proportions when freshly precipitated, and when in a pasty state. I found, however, that they are rendered considerably more soluble by employing ammonia for the precipitation of the alkaloids from their saline solutions, and by adding ammonia in excess till the bases are redissolved. I have made the following experiments for ascertaining the degree of solubility of the cinchona alkaloids, and I employed two kinds of commercial liquor ammoniæ of different strengths. A. Liq. ammoniæ of sp. gr. 0·92. B. Liq. ammoniæ of sp. gr. 0·96.

1. *Quinine.*—An aqueous solution of pure sulphate of quinine, saturated at 12° to 15° C. contains, as has been pointed out before, not always constant quantities of sulphate of quinine. A great many determinations of solubility, made with pure sulphates, procured from various manufacturers, furnished the proportions 1 : 770 to 1 : 738. Most of the sulphates were soluble in 750 to 755 parts of water of 15° C., and these numbers may therefore be taken as average numbers of solubility. According to Baup* sulphate of quinine is soluble in 7·10 parts of water of 13° C.; according to Jobst and Hesse† in 793 to 788 parts at from 6 to 9·5° C.

The salt which served for the following determinations of solubility was dissolved in 752 parts of water of 14.5°C.

5 c. c. of this solution were treated in a test-tube with measured quantities

* Ann. de Chimie et de Phys., xxvii. 328.

† Annalen der Chemie und Pharmacie, cxix. p. 365.

of Liq. ammoniæ, till the cloudiness which at first made its appearance had again completely disappeared, when they required

Of Liq. Am., A.	Of Liq. Am., B.
4·5 c. c.	6·6 c. c.
4·6 „	6·5 „
4·8 „	6·8 „
4·7 „	6·6 „
4·6 „	6·8 „
4·8 „	6·7 „

Samples of pure sulphate of quinine, which were a little more soluble, required a few tenths more of both test liquids, but I never met with a pure salt which required more than 5 c. c. of the test solution A, and 7 c. c. of the test solution B, per 5 c. c. of the sulphate solution.

It will be a safe course, therefore, to adopt in every case the last-mentioned limits of solubility as a basis in the estimation of common quinine salts.

2. *α Quinidine.*—The solubility in water at 15° C. of the sulphate of α quinidine, employed for the following experiments, was 1 part in 223. 1 c. c. of a solution of the sulphate saturated in the cold, when treated with the above test solutions of Liq. ammoniæ, till the precipitate which appeared at first had completely redissolved, required

Of Liq. Am., A.	Of Liq. Am., B.
10·7 c. c.	12·6 c. c.
10·8 „	12·8 „
11·0 „	12·7 „
11·0 „	12·8 „
10·9 „	12·8 „

1 c. c. therefore requires from 10·5 to 11 times more of the test-liquor A than a corresponding quantity of a solution of sulphate of quinine saturated in the cold.

3. *β Quinidine.*—Solubility of the sulphate in water of 15° C.

(a.) of a sample prepared in the year 1859, 1 : 112.

(b.) of a sample prepared in the year 1860, 1 : 105·5.

1 c. c. of a solution of these samples, saturated in the cold, required, in order to produce the above reaction—

	Of Liq. Am., A.	Of Liq. Am., B.
For sample A, on an average	14·3 c. c.	on an average 15·2 c. c.
„ „ B, „ „	14·6 „	„ „ 15·6 „

or about 12 times more than a solution of the pure quinine salt. After standing for half an hour the ammoniacal solution became turbid, and the alkaloids separated, probably completely, in the form of small granular crystals, which were not redissolved even in a large excess of NH_4O.

4. *γ Quinidine.*—Solubility of the sulphate in water of 15° C. = $\frac{1}{2\,0\,5}$.

1 c. c. of a solution,, saturated in the cold, required on an average of Liq. am. A, 10·9 ; of Liq. am. B, 12·5.

5. *Cinchonidine.*—The sulphate of cinchonidine of commerce contains frequently considerable quantities of quinidine, sometimes also traces of quinine. Its solubility in water of of 15° C. varies from $\frac{1}{9\,8}$ to $\frac{1}{1\,1\,0}$.

1 c. c. of a solution of the sulphate of cinchonidine, saturated in the cold, required on an average of Liq. am. A, 16 c. c. ; of Liq. am. B, 15·9—16·2 c. c., or from 12 to 13 times more than 1 c. c. of a solution of sulphate of quinine.

6. *Cinchonine.*—Water of 15° C. dissolves $\frac{1}{5\,4}$ of its own weight of sulphate ; 0·5 c. c. of this solution remains turbid even after the addition of as much as 150 c. c. of either of the ammoniacal test-solutions. The alkaloid separates

in large flakes, which become finely divided when the liquid is shaken, imparting to the solution a slight opalescence, and which are slowly deposited at the bottom of the test-tube when allowed to stand quietly for a short time, since the alkaloid had never been dissolved, but merely suspended as a finely-divided precipitate in the liquid.

By adding, however, from 1 to 6 drops of solution of cinchonine to about 30 to 55 c.c. of a solution of sulphate of quinine, and treating 5 c.c. of this mixture with 5 c.c. of test liquor A, or 7 c. c. of the ammonia solution B, the cinchonine is at first dissolved, because it is precipitated, together with quinine, in a finely divided state, and because ammonia then acts more readily upon it. After the lapse of half an hour, however, flakes of precipitated cinchonine again make their appearance, even in this mixed solution.

B.—Principle and Application of the Quinine Test.

According to A., ex. 1, we may take it as an established fact, that 5 c. c. of an aqueous solution of pure sulphate of quinine, saturated in the cold at 15 c., do not require more than 5 c. c. of the ammonia solution A, and 7 c. c. of the ammonia solution B, in order to become precipitated and redissolved.

This quantity of ammonia is however insufficient, as was proved by experiments 2, 3, 4, 5, and 6, whenever the sulphate of quinine contained larger or smaller quantities of the sulphate of α, β, and γ, quinidine, cinchonidine and cinchonine. The last-named salts are dissolved, first, by digesting with water any quinine salt which is suspected of having been adulterated by these admixtures. They can be traced with great accuracy by adding just 5 c. c. of the test fluid A, or 7 c. c. of fluid B., to 5 c. c. of an aqueous solution saturated in the cold, of a sample of the mixed sulphates which has to be tested for these less valuable salts. Even very slight traces of the foreign alkaloids which escape detection by the ether method, may be recognized in the solution by the opalescence of the mixture, provided the experiment is properly carried out.

2. *Test Fluid.*—If Liq. ammoniæ of the strength ordered in the London Pharmacopœia, that is, of sp. gr. 0·960, is at hand, it may serve as test fluid; it is more accurate and safe, however, to standardize an ammonia solution of unknown strength by means of a standard solution of sulphate of quinine saturated in the cold, and of known purity.

3. *Preparation of the Solution of Sulphate of Quinine required for Analysis.*—It is especially necessary that the distilled water employed should not be warmer than 15° C., since the sulphate of quinine is considerably more soluble in water which is only a few degrees above that temperature. Water possessing this temperature, is easily obtained both in summer and winter; if above that temperature, it must be cooled down by placing the vessel containing the quinine salt into fresh spring water. From two to four grammes of the sulphate (which must, of course, be neutral) are agitated in a small beaker with 20 to 40 c. c. of distilled water till they are dissolved to a pasty fluid. After digesting for about half an hour, the whole is thrown on a small filter, either of paper or linen, and squeezed, and the solution thus obtained again filtered till it is obtained perfectly clear.

4. *Qualitative method.*—5 c. c. of this solution of sulphate of quinine are measured out into a dry test-tube then treated with 5 c. c. of the standard solution of ammonia of sp. gr. 0·92, or with 7 c. c. of a standard solution of ammonia of 0·96 sp. gr., or also with a corresponding number of c. c. of a standard solution of ammonia of different sp. gr., so as to prevent the two layers of liquid from mixing at first as little as possible. The test-tube is then closed with the thumb, and the liquid made to run repeatedly backward and forward, whereby the mixture will be found to have become perfectly clear and free from suspended alkaloid, or will become so after a few minutes. Violent agi-

tation of the liquid in the test-tube is objectionable, because ammonia gas is liberated, and would render the reaction inaccurate. Should the experiment give a doubtful result,—that is, should the liquid exhibit only a slight cloudiness,—a more concentrated solution of the foreign alkaloids with which the quinine is contaminated is made by digesting a larger quantity of the sulphate of quinine under examination in less water, ex. gr. 5 grm. in 30 c. c. of water. For commercial purposes it will, however, scarcely be required to submit a sulphate of quinine which had been dissolved in the former amount of water and showed no opalescence, or only a slight cloudiness, with the above standard solution of ammonia, to further tests; since a slight cloudiness which disappears on the addition of a few more tenths of a c. c. of the ammonia solution, would scarcely justify one in forming an unfavourable opinion of a sample of commercial sulphate of quinine.

5. *The following numbers were obtained in the Qualitative Analysis by means of a Standard Ammonia Solution :—*

Mixture.	Results.
5·0 grm. of sulphate of quinine, and 0·25 „ „ β quinidine. (= 5 per cent. impurities.)	An immediate heavy precipitate.
5·0 grm. of sulphate of quinine, and 0·05 „ „ β quinidine. (1 per cent. impurities.)	Strong cloudiness; after a few minutes a heavy flocculent precipitate.
5·0 grm. of sulphate of quinine, and 0·025 „ „ β quinidine. ($\frac{1}{2}$ per cent. impurities.)	Strong opalescence; after half an hour's standing a precipitate of β quinidine.
5·0 grm. of sulphate of quinine, and 0·01 „ „ β quinidine. ($\frac{1}{5}$ per cent. impurities.)	A slight cloudiness, which increased in the course of two to three hours, and exhibited a slight but distinct precipitate after four hours' standing.
5·0 grm. of sulphate of quinine, and 0·005 „ „ β quinidine. ($\frac{1}{10}$ per cent. impurities.)	No reaction; a more concentrated solution (*vide* sub. B. 4) showed however a slight opalescence.

Five experiments made with admixtures of corresponding amounts of pure sulphate of cinchonidine to a pure sulphate of quinine gave the same results :

Mixture.	Results.
5·0 grm. of sulphate of quinine, and 0·005 „ „ β cinchonidine. ($\frac{1}{10}$ per cent. impurities.)	Even a more distinct reaction than in the case of β quinidine.

Five experiments of admixtures of 5, 1, $\frac{1}{2}$, $\frac{1}{5}$, and $\frac{1}{10}$ per cent. of sulphate of cinchonine to pure sulphate of quinine, gave almost equally close results; the separation of the alkaloid took place, however, for the most part, in flakes, without any previous opalescence.

6. *Quantitative Method.*—There can be no doubt that the ammonia test may also be employed with advantage for the quantitative estimation of foreign cinchona salts contained in sulphate of quinine, for the separation of which hitherto tedious and uncertain methods had to be employed. It will be found the more useful when an actual adulteration has to be traced, or when a so-called *Chinin-sulphuric naturale*,—sulphate of quinine which contains much quinidine,—such as has been frequently met with in commerce lately, has to be examined.

Such samples will have to be extracted with water by a somewhat modified process, viz., by treating about 5·0 grm. repeatedly with small quantities of

water, till a portion of the filtrate gives no longer the ammonia reaction. The extraction with water must not be interrupted too soon, and the qualitative test—for which the least possible quantity of the filtrate only ($\frac{1}{2}$ to 1 c. c.) is employed—ought only to be resorted to when, according to a preliminary rough experiment, it may be expected to give a negative result. The whole of the filtrate is then introduced into a graduated measure glass, and diluted to a round number of c. c. (varying probably from 30 to 100 c. c.), and a measured quantity of the liquid ($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, etc.) mixed with the standard ammonia solution in the proportion employed for the qualitative analysis. The precipitated alkaloid is allowed to settle, and then rapidly thrown on a good filter, washed at first with a weak solution of ammonia, and lastly with water, well dried at 100° C. till its weight remains constant. The results are sufficiently accurate.

7. The following quantitative numbers were obtained: (*a.*) a mixture of 4·0 grm. of pure sulphate of quinine, and 1·0 grm. of pure sulphate of cinchonine, were separated according to B. 6. Total aqueous extract=100 c. c.

50 c. c. treated with 52 c. c. of ammonia solution, of 0·92 sp. gr. left 0·405 grm. of alkaloid undissolved. 5 grm. of the purposely adulterated quinine salt contained therefore $\frac{100 \times 0{\cdot}405}{50} = 0{\cdot}810$ of a foreign alkaloid (Ci.) or $0{\cdot}810 \times 1{\cdot}217 = 0{\cdot}986$ of sulphate of cinchonine.

After having ascertained that the foreign admixture consisted of cinchonine or cinchonidine, the weight of the alkaloid found is simply multiplied by 1·217 in order to find the amount of sulphate present, or in the case of quinidine, etc., by the factor 1·333.

A mixture of 4·80 grm. of pure sulphate of quinine, and 0·20 grm. of pure sulphate of quinidine, were separated in a similar manner. Total amount of filtrate=50 c. c. 25 c. c. were precipitated with 35 c. c. of the standard ammonia solution of 0·96 sp. gr., and gave 0·072 grm. of a precipitate $\frac{50 \times 1{\cdot}333 \times {\cdot}072}{25} = 0{\cdot}1919$ instead of 0·20.

If the composition of the foreign sulphate is not known—which is generally the case—it will be safer simply to compare the quantity of the free base found with the average percentage of pure sulphate of quinine=75 per cent. (Freshly re-crystallized sulphate of quinine, dried by pressure between filter paper without application of heat, contains 73·5 per cent. of quinine).

8. *Examination of other Officinal Cinchona Salts.*—It is evident that the ammonia test can be employed likewise in the estimation of cinchona compounds, which are more soluble than sulphate of quinine, of course by employing other proportions for their mixtures. 1 c. c. of pure hydrochlorate of quinine requires ex. gr. 22 c. c. of the ammonia solution of sp. gr. 0·92 for its precipitation, and in order to re-dissolve the alkaloid in excess, whilst solutions of other hydrochlorates of the cinchona bases cannot be re-dissolved, even on adding a large excess of ammonia. In examining these readily soluble salts it becomes necessary, however, first to dilute measured quantities of solutions, saturated in the cold, with water to the proportion in which sulphate of quinine is soluble, before adding the ammonia solution, since ammonia precipitates quinine from concentrated saline solutions, in lumps which are as difficult to re-dissolve when they have once been precipitated, as are the foreign bases.—*Zeitschrift für Analytische Chemie.*

ON THE INTRODUCTION OF THE CINCHONA PLANT INTO INDIA.

BY CLEMENTS R. MARKHAM, ESQ., F.R.G.S.

(*Concluded from Vol. III. p.* 618.)

The Cinchona Forests in South America.—Having now given some account of the causes which have made this measure so important, of the previous attempts to introduce the cinchona, of the measures which I adopted for performing the service entrusted to me, and of the present prospects of the experiment, I will proceed to give an account of the forests in South America where the cinchonas grow, and of the results of my examination of some of the Hill-districts of the Indian Peninsula, with a view to ascertaining their suitability as sites for the future cultivation of cinchona plants.

Extent of the Cinchona Forests.—The forests on the Eastern declivities of the Andes, for a distance of upwards of 700 leagues,—from 19° S. latitude, where in 1846 Dr. Weddell discovered the species which he named *C. australis*, to the snowy range of Santa Martha in 11° N.,—are the native region of the cinchona plants.

C. Calisaya forests.—Commencing from the South, the forests of Bolivia and of Caravaya in Peru, on the Eastern slopes of the Andes, in a belt from 4000 to 6000 feet (according to my own observations) above the sea, are the homes of the *C. Calisaya*, long considered the most valuable species of cinchona. The formation of this region consists entirely of Lower Silurian rocks, clay slates with veins of highly auriferous quartz. The *Calisaya* region may be divided into two distinct belts, namely the lofty *Pajonales* or meadows interspersed with thickets, and the *Montanas* or dense forests which succeed at a lower elevation.

1. *The Pajonales* are long spurs running out from the snowy range of the Andes to the North and East, until they gradually subside into the vast forest-covered plains. Their sides are generally covered with dense forest, while the summits of the ridges are clothed with rich pasture land, interspersed with small thickets in the ravines and gullies. The grass is a *Stipa* growing in large stiff bunches, dotted here and there with a little white lily; and the flora of the thickets consists of *melastomas*, *tree ferns*, *andromedas*, *palms*, *pentstemons*, *incense trees*, *Cinchona caravayensis* which yields no alkaloid, and the shrubby variety of *C. Calisaya*, named by Weddell *β Josephiana** which abounds, and is equally valuable with the larger variety. In this region there is almost constant rain for six months in the year, while continual mists and showers keep the vegetation constantly wet during the remaining six. In the months of April and May, equivalent to October and November in India, the temperature ranged between 69° and 53° Fahr.

2. *The Montana* or lower forests, in the ravine where my collection was made, rest on a yellow clay slate, traversed by veins of auriferous quartz.† They clothe the hills from the banks of the river Tambopata to the summits of the mountain peaks, and contain, besides India rubber, and other forest trees of gigantic size, numerous *palms*, innumerable *ferns*, the *mimosa* bearing the paccay fruit, *urticas, erythroxylons*, *melastomas*, and an immense variety of cinchonaceous trees. From September to April there is almost constant rain; May is a showery month; and June, July, and August are dry with occasional showers. In May the temperature ranged from 62° to 75° Fahr., and the average annual temperature is about 65°.

Forests of the Grey and Crown Barks.—Beyond the Peruvian province of Caravaya, to the North and East, although exactly the same Silurian formation long continues to be the basis of the soil, and though there is the same climate at similar elevations, the *C. Calisaya*, and indeed all the valuable species, entirely cease to appear. Such

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* This variety of *C. Calisaya* was named Josephiana by Weddell, in honour of the French botanist Joseph de Jussieu, who came out to South America with M. La Condamine in 1735. In 1739 he examined the forests of the *C. Condaminea* near Loxa; and afterwards explored those of Upper Peru; but in 1750 he was robbed of all his valuable collections by a servant, when on his way home by way of Buenos Ayres.

† The ravine of Tambopata, in the Peruvian province of Caravaya, near the frontier of Bolivia.

useless species as the *C. pubescens*, *C. amygdalifolia*, and *C. scrobiculata* alone appear on the Eastern declivities of the Andes, between Caravaya and the forests of Huanuco in 10° S., when the species yielding grey bark commence.* Further North, and nearly up to 5° S., the cinchonas in the forests round Jaen de Bracamoras, (and which crown the precipices bordering on the famous strait of Manseriche, in the river Maranon) such as *C. Humboldtii*, again become worthless, until the famous forests of Loxa are reached,—the region of the *C. Condaminea*. The Loxa forests are from 6000 to 8000 feet above the sea, in a mean temperature of from 60° to 65° Fahr., and on a formation of gneiss and micaceous schist. In this temperate cinchona region, grow *palms*, *tree ferns*, *Liliaceæ*, *Ericaceæ*, *melastomas* with a purple flower, *astronias*, arborescent *passifloras*, *bocconnias*, *gunneras*, *thibaudias*, *cecropias*, *fuchsias*, gigantic climbers, beautiful *alstrœmerias*, *Aroideæ*, *myricas*, and many species of *Symplocos*, besides a variety of cinchonaceous plants.

Forests of the Red Bark.—We now come to the forests on the Eastern slope of Chimborazo, where the species yielding red bark, the value of which is now considered to be equal to that of *C. Calisaya*, first appears. I am unable, at present, to give any details respecting the flora and climate of this important region, but Mr. Spruce promises to supply us with a full report on this interesting subject shortly. I can only now state that the forests are upwards of 4000 feet above the sea, with a temperature from June to September between 74° and 60°, and that the finest cinchona trees grow in a stratum of yellow or reddish marl of great thickness.

Northern Limits of Cinchona Forests.—Proceeding northward along the Eastern declivities of the Andes, we find that the *Cinchonæ* disappear in the elevated plains of Riobamba, Quito, and Pasto, up to Almaguer, but reappear again in abundance north of that place, which is in lat. 1° 51′ 57″ N. and continue without interruption, by the Andes of Quindio, to the mountains of Merida and Santa Martha in 11° N.

In concluding this brief sketch of the nature of the cinchona forests, I shall quote the most correct and graphic description of a locality favourable for the growth of cinchonas that I have yet met with, by Dr. Karsten, which is translated in Mr. Howard's most valuable work, 'Nueva Quinologia,' No. 2.

Dr. Karsten's Description of a Locality Favourable for Cinchonas.—"The cinchonæ which are rich in alkaloids inhabit the peculiar cloudy region of the Andes in which, during the rainy season, which continues for nine months in the year, a steady rain is only interrupted during the day by short gleams of sunshine, interchanging with clouds and mist; whilst in that part of the year which answers to our winter, cold nights, in which the temperature of the air descends to freezing point, are followed by days in which the rays of the sun, piercing here and there, through the thick clouds, raise the temperature to 77° Fahr.; whilst the leaves are kept almost constantly bedewed by the continual mists."

"Ravines, stretching upwards into the grass-covered region and filled with forest vegetation, are the channels by which the streams of air ascend, when the mid-day sun warms the leafy covering of the mountain side. Here the mist first begins to form, when the strata of warm air, containing much aqueous vapour, mix with the colder atmospheric currents descending from the icy summits, and there ensues a frequently repeated alternation of thick mist, which entirely bedews the surface of the plants, and of warm sunbeams which dry and warm the moistened leaves. This lasts till late in the afternoon, when misty clouds overspread the whole district, until they are condensed by the cold of the night, to be again raised into vapour by the morning sun. This is the peculiar climate of those cinchonæ which are rich in organic bases."

Sudden Disappearance of Cinchonas, and well-defined Limits of Species.—The snowy range of Santa Martha, in lat. 11° N., has been mentioned as the extreme northern limit of cinchonas; but it is very remarkable that some of the mountains of Cumana, in Venezuela, such as Fumiriguiri, having elevations of 4000 to 5000 feet, and possessing a favourable cool climate, are destitute of cinchona plants, though close to the mountains where they abound. The only apparent reason for this is, that a belt of low land intervenes, and seems to break the chain which is continuous from 19° S. to

* The forests of the provinces of Cuzco, Ayacucho, and Farma (the two former of which I visited in 1853) intervene between Caravaya and Huanuco.

11° N. The same may be said of the forests on the high table-land of Jalapa in Mexico, which possess a climate and elevations exactly similar to those of Upper Peru; and where the aspect of the land, the tree ferns, arborescent melastomaceæ, cool temperature, and humidity, would lead one to expect the presence of cinchona; yet this is not the case. This may arise from the almost entire disappearance of the Cordillera of the Andes, near the Gulf of Cupica, and the Isthmus of Panama, being below the level of the cinchona region, the continuous chain is thus again broken. This sudden disappearance of cinchona at a particular point, although there are localities suited for their growth, at no great distance; and the distinct and well-defined limits which confine the different species to particular districts, without apparent cause, are noticeable facts connected with the cinchona trees; and are, I believe, not applicable to the plants which are associated with them.

Comparison between the Cordilleras and the Western Ghauts.—Let us now compare the cinchona region of South America with that of the Western Ghauts in the Peninsula of India; and, with the data given above, endeavour to form a judgment as to whether localities sufficiently resembling their native habitat, can be found at so vast a distance.

Climatic and other Conditions Necessary for the Growth of Cinchonas.—It will have been gathered from what I have said respecting the South American Cinchona region, that the conditions most favourable for the production of quinine in Cinchona plants, are those of continuous vegetation with a mean temperature of from 60° to 70°, varying according to the species; elevations of from 4000 to 8000 feet; and a constant supply of moisture. It is the latter essential requisite which is most difficult to find in India, and which confines the eligible sites for cinchona plantations within the narrow limits of the region which enjoys the benefit of both monsoons.

Site chosen for a Plantation in the Neilgherries.—The first site which has been selected is in the Neilgherry Hills, at the highest available elevation that could be found south of the Himalayas. It is a wooded ravine at the back of the range of hills which rises behind the Government gardens at Ootacamund, and which entirely protects it from the West winds; whilst another high ridge completely screens it from the East. It is 7450 feet above the level of the sea, and, from its sheltered position, is warmer by several degrees, than Ootacamund. Like the thickets where the *Cinchonæ* abound on the *Pajonales* of Caravaya, in Peru, it is surrounded by steep grassy slopes, with an analogous vegetation. Thus *osbeckias* and *sonerilas* take the place of the purple *melastoma*, and tree *rhododendrons* and *gaultherias*, that of the Peruvian *andromeda*. The vegetation of the interior of the ravine also resembles, to some extent, that of the thickets on the Peruvian pajonales. In order to give a general idea of the flora of this locality, I here subjoin a list of genera of plants growing in the Neilgherry ravine, which has now been selected.

Amongst Cinchonaceous plants are *Hedyotis*, *Lasianthus*, *Coffea*, *Canthium*, *Grumilea*, *Psychotria;* and the other genera are *Vaccinium*, *Myrsine*, *Symplocos*, *Ilex*, *Eugenia*, *Myrtus*, *Lonicera*, *Jasminum*, *Michelia*, *Osbeckia*, *Sonerila*, *Solanum*, *Sapota*, *Isonandra*, *Passiflora*, *Viburnum*, *Lobelia*, *Rubia*, *Acanthus*, *Piper*, *Cinnamomum*, *Convolvulus*, *Begonia*, *orchids*, and *ferns*. Outside the thicket, on the grassy slopes, are tree *rhododendrons*, *Gaultheria*, *Galium*, *Berberis*, *Lycopodia*, *brake*, *ferns*, *lilies*, and numerous small wild flowers.

The temperature appears to be almost identical with that of the Peruvian *pajonales;* and the spot receives a moderate supply of rain and mist, during both monsoons. It is true that this wooded ravine is more elevated, by nearly 1500 feet, than any point in Caravaya where I found the *C. Calisaya* growing; but Ootacamund is more than two degrees nearer the Equator; and the temperature of the two places appears to be almost identical. I am of opinion that this side will prove suitable for the growth of those species and varieties of *Cinchonæ* which prefer lofty situations—from 6000 to 8000 feet above the sea,—such as *C. lancifolia*, *C. Condaminea*, *C. nitida*, and the *Josephiana*, or shrubby variety of *C. Calisaya*. It will be found to resemble the peculiarly favourable aspect described by Dr. Karsten, and quoted above.*

* In South America, and specially in Huanuco, the higher and colder the place of growth, the more value is attached to the bark.

Second Site chosen in the Neilgherries.—For the cultivation of the other valuable species, it was necessary to find a second locality at a somewhat lower elevation, and where there would be a much greater extent of land available for the plantation. Such a site was found on the declivitous, forest-covered slopes of the northern face of the Neilgherry Hills, overlooking the table-land of Wynaad; and I have seen no part of the Hill-districts which appeared to me so nearly to resemble the native habitat of the Cinchonas. The site is close to the travellers' bungalow at Neddiwathum, near the crest of the Ghaut, on the road leading from Ootacamund to Wanantoddy. The forest covers a declivitous slope, at an elevation of about 5000 feet, and extends to the verge of the steep descent into the table-land of Wynaad. There is a good supply of water in the forest; and the soil is rich and tolerably deep, its base being a mixture of syenite and laterite in rather curious combination. In this forest, amongst other plants, I found the *Hymenodictyon excelsum* (called by Dr. Roxburgh, *Cinchona excelsa*, but excluded from the list of *Cinchonæ* by Dr. Weddell), an *Andromeda*, *wild yam*, *cinnamon*, *pepper*, *coffee*, *wild ginger*, an *Obeckia* (*Melastomacæ*) with a purple flower, and numerous *orchids* and *ferns*. Moss in great quantities was hanging from the branches and trunks of the trees, a sure sign of much moisture. This jungle is within the limits of the region which receives both monsoons. Though protected to some extent from the S. W., it receives a full share of the monsoon during the summer, and is also refreshed by the N. E. monsoon, coming across Mysore, from October to December. During the remaining months it is not without mists and heavy dews in the nights, until the S. W. moonson again commences in May. Eventually the plantation might be extended to a considerable distance to the east and south, at the same elevation, to the Falls of the Moyaar, a tributary of the Cauvery; and even further still in the direction of Kalhutty.

The road which passes by Neddiwathum leads to the coffee estates of Wynaad, of which there are now upwards of forty belonging to European settlers; thus the planters will often pass the cinchona plantation, and, when its success is secured, it is to be hoped that some of them will undertake the cultivation in the forest lands immediately above the line of their own coffee estates. Unfortunately the coffee plantations in the Neilgherries are all on the Southern side, near Coonoor and Kotagherry; which is too dry for the *Cinchonæ*, being outside the region of the S. W. monsoon. The *C. succirubra* yielding red bark, *C. Calisaya*, and *C. micrantha*, may all be cultivated in the forest which has been selected at Neddiwattum.

Sites selected for a Cinchona Plantation in Coorg.—Next to the sites selected in the Neilgherries, the mountainous district of Coorg appears better adapted for the growth of the cinchona plant, than any other part of the Western Ghauts. Tadi Andamol, the highest peak of Coorg, is 5780 feet, and its capital, Mercara, 4500 feet above the sea. During January, February, and March scarcely any rain falls, but the valleys are seldom without moisture; and, during my visit in January, heavy dews were frequent in the morning and evening, and at sunrise there were always long streaks of low-lying clouds resting on the sides of the ravines. At this season the belts of jungle, both on the Mysore and Malabar sides of Coorg, are scorched up with excessive dryness (a condition never known in the South American forests with which I am acquainted), but this was not so much the case in the loftier parts of the Coorg district. In April and May there are frequent showers; from June to August the rain comes down in torrents; in September and October there are showers; in November Coorg receives rain from the N. E. monsoon in small quantities, and December is foggy. The fall of rain on the Western side of Coorg, the only part suitable for *Cinchonæ*, averages 150 inches. The mean of the thermometer at Mercara, in 1836, during the hottest month was 78°, and during the coldest 68°; the average temperature being about 65°.

I examined the country in the neighbourhood of Mercara, and found a locality, to which I had been directed by Dr. Macpherson, which is well suited for a cinchona plantation. It is four miles from Mercara, by the side of the road to Mangalore. Its elevation must be a little over 4000 feet, and the forest, about a mile long, extends, in breadth from the road, down the steep sides of a ravine to the valley at the bottom, which is bare of trees. It contains many tall trees, though not growing close, and the underwood is very dense, consisting of five kinds of *ferns*, a *Solanum*, a *Lobelia*, etc. There were also *cinnamon*, *hymenodictyons*, *tree ferns* and *Melastomaceæ*;

and the general character of the flora appeared suitable for the growth of Cinchonæ. In this, the dryest season, I found two small streams trickling through the underwood. Further down the Mangalore Ghaut there are several flourishing coffee plantations, and when a Government cinchona nursery is successfully established in their neighbourhood, the planters may also undertake the cultivation. There are probably many other sides equally suitable for the growth of cinchona, in Coorg, but none so conveniently situated as regards Mercara. Labour, as is also the case on the Neilgherries, is chiefly procured from Mysore, the coolies coming up after their own work is done.

The Pulney Hills.—In the Madura district, the Pulney or Varragherry Hills, like the Neilgherry Hills further North, branch out in an Easterly direction from the main line of the Western Ghauts. United to a portion of the Anamallay range at their Western end, they stretch out into the Madura plains for a distance of 50 miles, and average a breadth of 15 to 20. They are divided into two parts—a lower series of hill and dale to the Eastward averaging a height of 4000 feet, where there is a great deal of forest, some cultivation, and several villages inhabited by people of the Vellaler caste; and a loftier region to the Westward averaging 6000 feet, with mountain peaks, the highest of which—Permanallic—attains an elevation of 7500 feet. The formation consists of gneiss, traversed by veins of felspar, and the soil of the Eastern part is a light reddish loam, yielding crops of garlic, mustard, two kinds of millet, besides groves of plantains; and lately the villagers have formed several small coffee gardens. In the Western and loftier part, the soil is very poor, being a heavy black peat, several feet thick, with a yellow, stiff clay as a subsoil. The rains on the Neilgherry Hills have the effect of mixing the decaying grass with the decomposed rock, and a rich soil is thus formed; but on the Pulneys this does not appear to be the case, the one becoming a black peat, the other a stiff clayey subsoil. These remarks apply to the interior valleys; but on the outer slopes, looking over the plains of Madura, there is good soil in places, and magnificent forests at the foot of a perpendicular wall of gneiss, which forms the Southern ridge of the Pulneys. There are also fine forests in the sheltered ravines, in which I observed trees of the following genera: *Michelia*, *Myrsine*, *Millingtonia*, *Cinnamomum*, *Dodonæa*, *Monocera*, *Symplocos*, *Bignonia*, *Crotalaria*, *Passiflora*, *Osbeckia*, *Jasminum*, besides a variety of cinchonaceous plants, such as *Hedyotis*, *Lasianthus*, *Canthium*, and *Hymenodictyon*. Tree ferns abound near streams; and, like the Neilgherries, the grassy plains are dotted with *rhododendrons*, *gaultherias*, *lobelias*, *hypericums* and *ferns*. I was told that during the season of the S. W. monsoon the Pulneys only receive passing showers, and in corroboration of this, I missed the *Berberis Mahonia*, a plant which, on the Neilgherries, is never found beyond the range of the S. W. monsoon. The Pulneys, however, receive the full benefit of the monsoon from the N. E.

There are several damp, well-wooded ravines near the settlement of Kodakarnel, where the species of *Cinchonæ*, which prefer great altitudes, might be established. When these plants are thoroughly rooted in the Neilgherries, a few might advantageously be sent to the Pulney Hills under the care of the gardener employed by the Collector of Madura,—Mr. M'Ivor having previously selected a suitable site. As the villagers have lately introduced the coffee plant, it is not improbable that they might also be induced to undertake the cultivation of the plant yielding quinine, of the value of which they are well acquainted.

The Anamally Hills.—The Anamally Hills probably possess several localities suitable for the growth of Cinchonæ, but being very feverish, and no European being yet established on them, it will probably be many years before they could be made available.

The Shervaroy Hills.—The Shervaroy Hills, in the Salem district, only attain a height of 3000 feet; and, being quite out of range of the S. W. monsoon, they are both too low and too dry for the growth of the cinchona plant.

Hills near Courtallum.—In Tinnevelly, the Courtallum Hills enjoy the full benefit of both monsoons, but the highest waterfall near Courtallum is only 2000 feet above the sea. Localities, however, may hereafter be found between Tinnevelly and Travancore, with an elevation of 3000 to 4000 feet, where the *C. micrantha*, and even the *C. succirubra* might thrive.

Mahableshwur Hills.—The only part of the Western Ghauts within the Bombay

Presidency which attains an elevation sufficient for the growth of *Ciñchonæ*, are the Mahableshwur Hills, the highest part of which is 4700 feet above the sea, in latitude 18° N. These hills are composed almost entirely of laterite, overlying the basalt of the Deccan, and the soil is exceedingly poor and shallow. The average temperature of the hottest month is 73°, and the coldest 62°, average mean temperature 65½°; but the climate in every respect is most unfavourable. From October to the end of April scarcely a drop of rain falls, and everything is dried up, the Mahableshwur Hills receiving no portion whatever of the N. E. monsoon; too wide an extent of land intervening between them and the Bay of Bengal. In May there are showers, and from June to September there is an unceasing deluge of rain,—the fall being estimated at from 250 to 300 inches. The most essential requirement for the growth of Cinchonæ is a continuous supply of moisture; and in a climate where, for upwards of six months in the year, they would be exposed to excessive dryness, they certainly would not live. In addition to these climatic obstacles, there is a great want of forest trees in the jungles, which would supply a sufficient amount of shade; the vegetation of the scanty thickets consisting chiefly of such shrubs and small trees as *memecylons*, *jasmines*, *Gnidia eriocephala*, *randias*, *indigoferas*, *willows* near streams, a small *Crotalaria*, *eugenias*, with an undergrowth of *solanums*, *Ophelia multiflora*, *ferns*, and *curcumas*. I visited both Coorg and Mahableshwur in the driest and most unfavourable period of the year; but the advantage, both as regards vegetation and moisture, was incomparably in favour of Coorg: indeed, I should say that there was no part of the Western Ghauts, of similar elevation, so entirely unsuited for the growth of Cinchonæ as the Mahableshwur hills.

Paunchgunny.—Ten miles to the Eastward of the station at Mahableshwur, and immediately overlooking the valley of the Krishna, there is a place called Paunchgunny. It is under 4000 feet above the sea, entirely exposed to the cold East winds during the dry months; the surrounding hills are destitute of jungle affording suitable shade, and altogether, it is the last place where cinchona plants would be likely to thrive. I regret this, because at Paunchgunny there is a small experimental farm belonging to a retired apothecary of the late Honourable Company's Service. Application has been made for some plants, and no doubt all possible care and attention would have been bestowed upon them.

Khasia Hills, Penang, and Tennasserim.—The cinchona plant, in its native forests, is entirely confined to the tropics, and it seems likely that the greater variation of temperature in extra-tropical regions would render any part of the Himalayan range unsuitable for its culture. Nevertheless, under cultivation, it may be found possible to extend the area of the cinchona region; and the Khasia Hills, in the Bengal Presidency, where the necessary elevations can be obtained,* may hereafter supply another site for a plantation; though, in the first instance, it would be imprudent to attempt the experiment in any other regions than those which most nearly resemble the cinchona forests of South America. In the island of Penang, and in the Tennasserim provinces, the necessary climate and elevation may also be found.

Ceylon.—On the whole, it will probably be found that the hill country of Neuerellia, in Ceylon, which possesses the necessary elevation, and is within the region of both monsoons, will be found as good a locality as any which I have described in the peninsula of India; and I am glad to hear from Mr. Thwaites that many of the coffee planters are extremely desirous of trying the cultivation of cinchonas on their estates. Mr. Thwaites has received some seeds of *C. micrantha* from Kew, which have not germinated, and there is little hope that those sent him by Mr. M'Ivor will be more successful. A good supply of Mr. Spruce's seeds will, however, have reached Ceylon by this time.

Operations for the future which are recommended.—In conclusion, it will be well to add some observations respecting the measures it will be advisable to adopt in conducting the future operations connected with this most important experiment, the success of which will establish, as a native of India, the plant yielding the most valuable

* Dr. Royle recommended, as well as the Neilgherries, the mountains of Chittagong and Silhet; adding that, on Chirrapoorjee, in lat. 25°, there was an elevation of 4286 feet.—'Himalayan Botany,' i. 240.

drug, as regards tropical countries, that is known in medicine; the supply of which now costs the Government of India upwards of £50,000 a year.

I have recommended that the experiment should, in the first place, and until the propagation of plants by cuttings has rendered success certain, be confined to the two sites already selected near the gardens at Ootacamund and at Neddiwatum; and that its management should be entrusted to Mr. M'Ivor, the Superintendent of Government Gardens at Ootacamund, whose zeal, intelligence, experience as a gardener, and knowledge on this special subject, probably exceeds that of any other person to be found in India.

There is every reason to hope that, before the close of this year, Mr. M'Ivor will have in the greenhouse at Ootacamund a goodly supply of healthy young plants, raised from plants and seedlings sent from Kew, and from Mr. Spruce's seeds, of the species *C. Calisaya*, *C. succirubra*, *C. micrantha*, *C. Condaminea*, and *C. nitida;* and it should be remembered that, as regards the *C. Calisaya* especially, if only one or two good healthy plants could once be established at Ootacamund, it would be easy to propagate them, in two or three years, to almost any extent. The Madras Government has already made the necessary grant for expenses connected with clearing and planting the site near the gardens, and a similar grant should be made for the proposed plantation at Neddiwatum. In order to reduce the expense as much as possible, Mr. M'Ivor has made an excellent suggestion, which has been approved,—namely, to plant the spaces between the cinchona trees with peppermint, the essence to be prepared and sold, so as to meet the necessary outlay in keeping up the plantations in the interval that must elapse before the cinchona trees can become profitable. I have recommended, in addition, that, as soon as the plantations in the Neilgherries are thoroughly established, a third plantation should be formed in the forest already described, in Coorg, on the Mangalore road, in the vicinity of the coffee estates; and also that some plants should be established in a carefully selected site on the Pulney Hills.

Method of Cultivation recommended.—The large forest trees should at first be left standing in the plantations, to protect the plants from the sun, the gales of wind, and heavy rains. When the cinchona becomes a cultivated plant, I believe that it will be found most profitable to grow it in its shrubby form, that more bark will be obtained from the shrubs than from trees occupying the same space of ground, and that the value of the bark will not deteriorate. Mr. Howard, the great quinine manufacturer, informs me that, though the large bark from trees is preferred, and yields rather the most quinine, the bark from small branches also commands a good price. Shrubs would undoubtedly suffer little from the bark being removed from their smaller branches, while large trees would never recover from the loss of the bark of their trunks: indeed, such a system would resemble that which has proved so destructive to the cinchona trees in South America.

It appears to me that cinchonas should be cultivated in the same way as coffee and cinnamon, and not be allowed to run up as trees. Cinnamon is the only other plant which is cultivated for its bark, excepting, of course, those which are grown for their fibre; and I therefore here insert a few particulars respecting cinnamon culture in Ceylon.

Cinnamon culture.—For the cinnamon gardens, the young shoots are peeled twice during the year, at a particular period of growth, when the bark comes off readily. This time is known at once by the peelers from the appearance of the young shoots, and the process of peeling is then a very expeditious one with practised hands. Young plants are raised from seeds in nurseries, and planted six feet apart, when they are a foot or 18 inches long. They will commonly bear peeling in 3 or 4 years after being transplanted, if in a favourable locality, and properly attended to. The roots are earthed up frequently to keep the soil loose and free from weeds.

Manufacture of Quinine.—From the Government plantations it may be expected that a considerable quantity of quinine-yielding bark will eventually be collected;*

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* One or two lbs. of bark is quite sufficient for an analysis. The taste of the bark by one who, by use, has learnt to distinguish it, is a good test of the presence of *quina*.

Pereira says that if the bark be powdered, then shaken with ether, and afterwards suc-

and, though the process of extracting quinine may be too difficult, and require too much skill, as well as expensive materials difficult of transit, to give any prospect of its being carried on *in situ*, there can be no reason why a manufactory should not be established in the Presidency town, so as to avoid the costly necessity of sending the bark to England.

Prospects of the Spread of Cultivation among Coffee Planters.—I think it likely that as soon as the coffee planters of Wynaad, Coorg, and Ceylon know that the Government experiment has been successful, they will be willing to undertake the cultivation of cinchona plants on their own account; and, for this reason, it is an advantage that the Government cinchona nurseries should be in the vicinity of the coffee estates. This valuable product, which has never yet been cultivated in South America, would then soon be as important an addition to the products of the Indian hills, in a commercial point of view, as coffee has already become.

Among Natives.—A great number of people have an impression that the natives can with difficulty be induced to undertake the cultivation of any new plant to which they have not been accustomed: but this is certainly erroneous as regards Southern India. Not to mention the potato, maize, tobacco, and capsicums, which are orginally natives of America, and are now generally cultivated in India, it is a fact that in Wynaad upwards of 2000 acres are taken up for coffee cultivation by the natives; in Coorg, where coffee was only introduced about six years ago, I scarcely saw a single hut to which a small coffee garden was not attached, and the villagers in the Pulney Hills have also commenced its cultivation. The extent too, to which the cassava, only lately introduced, is now cultivated in Travancore, is quite remarkable. There is every reason, then, to suppose that the natives will be equally ready to cultivate a plant yielding quinine, the value of which is so well known to them.

South America owes India something for the Products she has received from the Old World.—In obtaining plants and seeds of these valuable cinchonas, for introduction into India, the writer of this paper would certainly be the last person in the world to desire to do any injury to South America,—a continent in the welfare of which he has for years taken the deepest interest. The demand for quinine will always supply a market for the barks of South America; and I believe that the cultivation of the plant in India will bring quinine within the reach of a vast number of people who are now excluded from its use, will render the supply cheaper and more abundant, without in any way injuring the South American trade. It should ever be remembered that South America owes to India the staple food of millions of her people—namely, the plantain; and to the Old World most of her valuable products—wheat, barley, sugar-cane, the vine, rice, the olive, coffee, sheep, cattle, and horses. The people of Peru and Bolivia should not, then, through a feeling of petty jealousy, grudge to India a product which is so essentially necessary to her welfare. A few wretched officials may do so; but the more liberal and enlightened Peruvians, and there are many such, have shown themselves willing and ready to promote a friendly interchange of the products of the New and Old Worlds. Unfortunately, the latter class are in a minority, and have no voice in the conduct of the present Republican Governments.—*Transactions of the Medical and Physical Society of Bombay.*

PRO-GRANULATION.

"Suaviter in modo et fortiter in re."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—When a quasi-chemical, quasi-botanical, quasi-classical name is solemnly given to an occult preparation and paraded before the world as an Elixir Vitæ, it is well that

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cessively treated with chlorine and ammonia, the liquid will assume a green colour if the slightest trace of *quina* be present.—*Mat. Med.* II. pt. ii. *p.* 119.

But ether is awkward stuff to carry about, and materials for making chlorine rather heavy.

Another process of testing the presence of *quina*, by M. Guillemond, of Lyons, is given in the 'Pharmaceutical Journal' for October, 1859.

intelligent and educated physicians and pharmaceutists should say, "Pooh, pooh!" But when a process is announced by which, while the physician chooses his remedy, the pharmaceutist uses the resources of his art to present it in a palatable and elegant form to the patient, I say to the critics, Withhold! spare your lash! and consider before you pronounce "considerable doubts," "difficulty of precise application of heat," "indifferent remuneration," "uncertain methods," and lastly, but not leastly (look out for the cat) "very few retail Pharmaceutical chemists possess the conveniences necessary:" so says your worthy correspondent, Mr. Haselden. Well, Sir, and what then? Who prepares your morphia, your quinine, your alkali, your acid, your soda, your salts? The "retail Pharmaceutist"?—Oh no! The manufacturing chemist! Now what class of medicines are so well and so equally prepared, so reliable, and definite, as those which are prepared by the manufacturing chemist, who possesses "the conveniences necessary," which are beyond the capital or skill of the retailer? It is not to be denied that in this country the advance of our art is to be traced in the career of men who combined skill and capital, and who were not slow or reluctant to obtain the "conveniences necessary" for the improved methods which their skill discovered; and whenever a preparation passes from the hands of the dispenser to that of the manufacturer, I have no hesitation in saying that both in quality, uniformity, and price, the public gain a great advantage.

But let me revert for a moment to the merits of the case. Our friend Mr. Haselden "damns with faint praise" the granulated medicines. Good old-fashioned "brimstone and treacle" appear more palatable to him than "granulated Gregory's powder." To which I reply, "There is no accounting for tastes," I prefer the latter. Granulated effervescing carbonate of iron, citrate of soda-magnesia, seidlitz powder, and lemon-kali are preparations upon which it is scarcely possible that any other opinion should be pronounced than that they are unquestionably the most elegant preparations of the kind yet produced, and a decided stride in modern pharmacy.

I am, yours faithfully,

JOHN BAKER EDWARDS, Ph.D.

Royal Institution Laboratory, Liverpool.

THE GRANULATION OF MEDICINES.

"Omnia mutantur, nos et mutamur in illis."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—My attention has been directed to a paper in the last number of your Journal by Mr. Haselden, of Conduit Street, London, bearing the conservative title of "Anti-Granulation." With your kind permission I beg to respond to it in the following remarks.

Mr. Haselden may be right in his firm conviction that the granulation of most medicines is inexpedient; so far as my paper is concerned, I have chiefly advocated the *possibility* of granulating all officinal powders and pill-masses. As to the *proper* powders and pill-masses best fitted for granulation, time and experience can alone point them out. Because we cannot immediately foresee all the adaptabilities of a new power, surely we need not be pettish about it. As to the pilula galbani composita, pilula scillæ composita, pilula hydrargyri, etc., I do not suppose there would be any great difficulty in granulating them, particularly when I state that plain Norwegian tar has been and is daily *granulated* for me by Mr. Banner, without the admixture of more than an eighth of a foreign substance. Whatever Mr. H. may think theoretically of the difficulty of regulating the amount of heat in the drying process, I can only say that practically Mr. Banner has hitherto experienced no difficulty in doing so, and in supplying me with granules of various kinds which have given me in my practice as a physician the most unquestionable satisfaction. As to the question of adulteration, I very much fear that it matters not what form we adopt in the administration of medicines; foreign and cheaper material will always with difficulty be kept out. The remarks in my paper

refer chiefly to the odious "four per cent. system," showing to the profession that *impalpable* powders, requiring excessive drying, are uncalled for so far as the new process of granulation is concerned; consequently, if coarse and even damp powders will do as well, less loss will be experienced in the *wholesale* grinding of drugs, and probably, on that account, the four per cent. system might die a natural death. Mr. Haselden found that granules made from rhubarb, etc., weighed an eighth more after drying spontaneously; this only shows to what an excess the drying process was carried before the rhubarb was ground originally. Mr. H., I suppose, is aware of the great affinity rhubarb has for moisture, and how difficult it is to dry it; nevertheless, Mr. Banner has hitherto experienced no difficulty in drying granules of pulvis rhei compositus according to the directions given in my paper. To show the difference between a drug pulverized by the wholesale drug-grinder and a similar substance ground at home, let any chemist examine the powder of cubebs on his shelves with the powder of the berries fresh ground in a small coffee mill, and I am very much mistaken if he will conclude that they are one and the same thing; far less will he think so should he prescribe them weight for weight in disease, their effects being so different. Mr. Banner always grinds the berries every time he receives an order for cubebs, and by doing so he has given great satisfaction both to the profession and the public. Mr. Haselden is of opinion that the administration of granules to adults is a very difficult matter; and with children, "who are most generally the recipients of powders," he cannot see clearly how the granules would succeed with them. The best way for Mr. H. to find this out is to try them. I prescribe them daily, and I rarely find an exception to the rule of their being very easy of deglutition. Of course with infants and young children granulation will not succeed; but with children above two or three years of age and adults a salt or teaspoonful of granules is neither here nor there. Such is my *bonâ fide* every-day experience. Mr. H. instances Gregory's Powder: now I have no hesitation in saying that, with the exception of the "*Mistura Diabolica*" and Castor Oil and Turpentine, a teaspoonful of plain Gregory's Powder in a wineglassful of water is the most nauseous draught in the *Materia Medica;* while the same quantity of granular compound powder of rhubarb is scarcely ever smelt and is never tasted. As to any unpleasant sensation of choking or refractoriness on the part of the granules, it will generally be found to result from some idiosyncrasy on the part of the patient rather than the fault of the granules or their mode of administration.

With all deference to Mr. Haselden, I think he is sailing rather too close to the wind when he objects to giving granulated powders containing simple substances, as jalap, scammony, or rhubarb, or granulated effervescing powders, as the carbonate of iron, citrate of magnesia, etc., in doses of "spoonfuls." The best answer to this is, that in practice it is found to answer admirably; and one great advantage of the method is, that where a course of such form of medication is necessary, the patient can at discretion increase or diminish the dose according to circumstances, "heaping" or "brushing off" as his common sense, guided by the medical directions, decides.

Mr. Haselden evidently has misread my paper, when he cites the example of an extemporaneous compound powder for "a patient travelling by the next train." He asks, are the powders in this case to be mixed, granulated, dried, and coated? Certainly not. I have distinctly stated that "extempore granular powders *cannot be made at the time of dispensing* without great inconvenience and loss of time to the dispenser, unless some simpler and more expeditious plan is found out."

Mr. Haselden has not only denounced granulation as something very like a chimera, but he has at the same time totally ignored the great advantage which it possesses over all other forms of medication, namely, the power of preserving, for an indefinite length of time, the active principles and the chemical and physical properties of almost every solid drug, camphor not excluded. Whatever Mr. Haselden may have to say against the French system of Pharmacy, he surely cannot but admire the learning and writings of such men as Trousseau, Pidout, Soubeiran, and Bouchardat. Whilst I admit that there is much to be found fault with, particularly in the French school, still, there is much to admire both in the Continental and American schools of Pharmacy, and I do not see why we should be above borrowing from them all the good we can obtain.

It is all but needless to observe that Mr. Banner is daily improving the process of

granulation, and extending it to such substances as are suited to it; and were it not that I fear having already extended this communication beyond reasonable bounds, I should give the results of his further experience.

In conclusion, Mr. Haselden has doubts as to the "*form of powder being the most efficacious in which a medicinal substance can be administered.*" It may be a nostrum-looking maxim, but I am convinced it is founded in truth. Why, there is not an agent or a process in Pharmacy at all to equal the digestive power of the human stomach; and what are the processes of Pharmacy, if they are not for rendering the crude material "more agreeable, more convenient, more safe, and more efficacious"? Doubtless, Pharmacy can separate active principles and otherwise alter the elements of drugs; but these same active principles and altered elements may be given in the form of granules as well as other substances; and let me observe, that there is no officinal form of medication which so strictly represents all the active principles and elements of a vegetable or other solid drug as the powder; consequently, if carefully prepared, there is no form of medication more to be relied upon, or more efficacious, than that of the powder; and why?—simply because there is *none of it lost or altered in the process of digestion.*

I may be wrong, but I am much inclined to think that if there were more granular powders and fewer nauseous and expensive mixtures used in the "drug system of medication" in England, we should hear much less of homœoquackery and its globules or infinitesimal doses.

I have the honour to remain, Sir, your obedient servant,

THOMAS SKINNER, M.D.

1, *St. James's Road, Liverpool.*

SULPHITES AND THEIR USES.

It is stated by the Florence correspondent of the 'Medical Times and Gazette' (June 14), that a new series of salts have been tried with success by Professor Polli.

The following is a short description of these new remedies:—

"1. The sulphite of *soda* is soluble in water, and of an unpleasant taste; dose ʒj. to ʒij. per diem. A solution of 1 to 10 grains may be used for lotions.

"The bisulphite of soda is also soluble, but its taste is so bad that it should only be used externally, dissolved in ten parts of water.

"The hyposulphite of soda is soluble, and of tolerable taste. Dose gr. x. to ʒij. per diem.

"2. The sulphite, bisulphite, and hyposulphite of *potash* are all soluble; but only the last-mentioned should be administered internally, in doses varying from gr. v. to ʒj. per diem.

"3. The sulphite of *magnesia* is the most soluble of all sulphites, the richest in sulphurous acid, and the least unpleasant to the taste. ʒss to ʒij. may be given per diem, in ten-grain doses.

"The bisulphite and hyposulphite would be equally suitable for internal use, but are better dispensed with, as they are, by air and moisture, rapidly changed into sulphite of magnesia.

"4. The sulphite of *lime* requires 800 parts of water for solution, while the bisulphite and hyposulphite are easily soluble. These three salts have been given in doses of only gr. iij. to gr. vi. per diem. Signor Polli recommends them in the purulent stage of consumption, where they are, according to him, apt to check the absorption of purulent matter and to favour the cicatrization of vomicæ.

"5. Lastly, the sulphite, bisulphite, and hyposulphite of *ammonia*, are all very deliquescent, and of a pungent taste. They are easily changed into sulphates, and can only be used externally.

"All the sulphites which can be administered internally, may be given either in powder, mixed with sugar, and flavoured according to taste; or in edulcorated solutions. The sulphite of magnesia and the three salts of lime are preferable for internal, the others for external use. The hyposulphites in general have been found to act most

slowly, inasmuch as they must first pass into the state of sulphites. They are rapidly decomposed by vegetable acids, but not altered by acetic acid, whence Signor Polli concludes, that during their use all kinds of fruit should be avoided, while vinegar may be allowed."

FURTHER OBSERVATIONS ON THE INEFFICIENCY OF HYOSCYAMUS AS USUALLY PRESCRIBED.

BY M. DONOVAN, M.R.I.A., ETC.

In my former communications I showed that physicians use unnecessary caution in the adminstration of tincture of henbane when they employ it in doses of one or two drachms. I stated that I and some other persons had each taken an ounce of the tincture without any effect, the tincture having been prepared from the plant in its cultivated state, its wild state, dried, recent, and grown in various places in the British Isles. Had I been then acquainted with a fact which has since come to my knowledge, I need not have made any such experiments. In the 'Dublin Medical Press' (May 14, 1862, page 491) there is a translation from the Bull. Gén. de Thérap., of an article on vegetable extracts by M. Hirtz, in which the author informs us that the extract of the leaves of hyoscyamus was given to patients in the dose of 50 to 75 centigrammes a day with results only slightly marked, and even these rather inconstant; a gramme was sometimes given without any observable effect. Now a gramme is equal to 15·43 Troy grains.

In order to compare this result with mine stated above, I evaporated one ounce of the tincture (the same as had already served for my former experiments) until it assumed the usual consistence of extract of hyoscyamus. The evaporation was conducted at a very low heat, and the weight of the extract ascertained with great care: it weighed 8·4 grains. This is very little more than the half of the dose of the extract which M. Hirtz administered without any observable effect. I might, therefore, have made the dose of the tincture taken by myself and friends at least two ounces, without any discoverable result. If two ounces had no effect, three ounces could not have much, unless it produced intoxication. In fine, I venture the opinion that tincture of the leaves of hyoscyamus should be expunged from the Pharmacopœia. Those physicians who venture on two-grain doses of extract of henbane will learn with interest that M. Hirtz gave fifteen grains and a half without any effect. His were clinical experiments, and therefore afforded the best opportunities for observation. I believe the case would be very much otherwise if the seeds were used instead of the leaves.—*Dublin Medical Press.*

THE CONVERSION OF LACTINE INTO OXALIC ACID BY MUCEDINOUS FUNGI.

The following letter from Mr. E. M. Rimmington, Bradford, appeared in the *Lancet* of May 10th:—

Whilst engaged in repeating the experiments of L[illegible] especting spontaneous generation, I have been led to the discovery of a [illegible]ular and unexpected metamorphosis in milk by the agency of a mucedinous fungus: the conversion of the lactine into oxalic acid, and consequent formation of oxalate of lime. Believing this to be not only an interesting but an important fact (from its bearing on some other questions), and having fortunately preserved a record of the experiment, I am enabled to give the entire history of it.

On the 17th September of last year I poured into a test-glass some milk, which had been previously boiled and kept in a flask some months; the milk at the time being perfectly sweet and good. The glass was then tied over with writing-paper and set aside. In the course of eight or ten days afterwards, a few white tufts of mucor appeared, and gradually spread over the whole surface; the mycelium, as the growth

proceeded, penetrating deeper into the fluid, the volume of which slowly diminished as it became consumed by the vegetation.

After the lapse of some months, there commenced at the surface of the milk, and at the under surface of the stratum of floccose mycelium, a zone or stratum of fluid of light-brown colour, which slowly increased to a deep coffee-brown. It also increased in amount, until the whole fluid was involved in the change. At the time, I attributed this discoloration to some putrefactive decomposition, and did not examine it. The glass and its contents remained in the window of the laboratory, unnoticed and uncared for, until a few days ago, when I thought it time to put it to some more useful purpose. Before carrying this intention into execution, it occurred to me that, after keeping it nearly twelve months, it would be as well to examine the ultimate result of the changes it had undergone.

The original quantity of milk was about three ounces; of this, only two or three drachms was left at the bottom of the glass, which, as before stated, was of a dark coffee-colour quite free from smell, and neutral. I decanted it into another glass, and then observed a crystalline sediment. Some of this I proceeded to examine with the microscope, and found it to consist of crystals of oxalate of lime in large and beautiful octahedra and dumb bells. On examining a portion of the mycelium, I found it full of similar crystals, entangled among the filaments and apparently adherent. The entire quantity I obtained may be one or two grains, but sufficient to supply many microscopic specimens. If any gentlemen feels sufficiently interested to desire to verify my observations, a specimen will be forwarded on application per letter with stamps for postage.

MISCELLANEA.

Fatal Explosion.—On Saturday morning, June 7th, a terrible explosion occurred on the premises of Mr. Boor, wholesale and retail chemist and druggist, 55, Bishopsgate Street Without, which resulted in the deaths of two persons, Ada Minnie Boor, aged sixteen months, and Sarah Ann Bordeaux, aged thirty-five. The premises were totally destroyed. On Tuesday June 10, an inquiry was held before Mr. Serjeant Payne, the Coroner, for the purpose of investigating the cause of the disaster. From the evidence given it appeared that the two porters, after they had taken down the shutters about eight o'clock, went into the cellar, where they perceived a peculiar smell. One of the men tried to light the gas, but could not; he then threw down the match, and shortly afterwards the explosion occurred. A strong smell was experienced, described by some of the witnesses to be that of ether, and by others as that of phosphorus and methylated spirit. It was also stated that on the previous night the gas suddenly went out in the drawing-room and in the shop. Mr. Boor, who was out of town at the time of the accident, stated that he was unable to account for the explosion, but was of opinion that it arose from an escape of gas. Methylated spirits could not have exploded, as they were kept in iron-bound vessels. The powdered phosphorus was perfectly harmless, and might be exposed to the atmosphere for years without danger of igniting: if a light was dropped on it, it would not explode. He had no ether in the cellar, and only a little in the shop, which was kept in a well-stoppered bottle. The porters, who had arrived late that morning, in their hurry to get the shutter-bar placed away, might have knocked the gas-pipe running along the ceiling and broken it, or the accident might have arisen from some defect in the meter, as the gas went out on the previous night. The other description of phosphorus there was no danger to be apprehended from, as it was kept in tin cases sunk in a well of water. When at home he always turned the gas off himself at night. The jury, after consulting for some time, returned a verdict of "Accidental death." Some of the jurors suggested an addition to the verdict, deprecating the keeping of large quantities of combustible materials in crowded streets; but the Coroner said that was only an opinion, and did not form a part of the verdict.

The Injurious Effects of Noxious Vapours.—In the House of Lords, on Friday, May 9th, Lord Derby moved for the appointment of a Select Committee to in-

quire into the injurious effects of noxious vapour in certain manufacturing processes. He disclaimed any intention of creating obstruction to the various manufactures of the country. The injuries of which he complained might not only be obviated, but, in some cases, the refuse might be turned into a source of profit. He instanced more particularly the manufacture of alkalies at St. Helen's, and described the process of manufacturing soda, in the course of which large quantities of muriatic acid gas were given off, which had a most injurious effect on surrounding vegetation. After some remarks by Lord Granville, the motion was assented to, and on Monday, May 12th, the Committee was nominated.

Peroxide of Hydrogen.—This remedy has been brought before the Medical Society of London, by Dr. Richardson. The process adopted was that of Thénard, in which the peroxide of barium is used as the agent for supplying the oxygen, with hydrochloric acid as the displacing body. The strength of the solution recommended as the best and most applicable, was one charged with ten volumes of oxygen; and the dose of this solution for an adult was from one drachm to half an ounce, in a liberal quantity of water.

Tincture of Boletus Laricis Canadensis in Acute Rheumatism.—A tincture of Canadian Agaric has been tried with success in cases of acute rheumatism by Dr. J. A. Grant, Physician to the General Protestant Hospital, Ottawa City. ('British-American Journal,' April, 1862.)—Dr. Grant does not give any formula for preparing the tincture, but we presume it was made in the usual proportions. In most of the cases described it was given in the form of mixture, consisting of one ounce of the tincture with seven ounces of water, of which a tablespoonful was given every three hours.

Rival Druggists.—A druggist, Gustave Laurens, had been established for several years at Marseilles, when a cousin, by name Paul Gustave Laurens, set up a rival establishment in an adjoining street, dropping the name Paul, and calling himself Gustave Laurens like the other, under the plea that this was really his name. The tribunal has insisted that he should make known to the public that he is not the real Simon Pure, and for this purpose even the addition of the dropped Paul is not considered enough. He is commanded, within ten days, to affix over his shop, to his labels, etc., the word "cousin" in addition to his surname, suppressing the Christian name Gustave, to advertise the decree in four newspapers of the town, and to pay all the expenses of the action.—*Dublin Medical Press.*

Red Gum.—A gum has been imported under this name from Western Australia, a specimen of which was laid on the table at one of our recent evening meetings (Vol. III. page 495). Large quantities of this gum, under the name of Botany Bay Kino, the produce of *Eucalyptus resinifera*, have been sent to this country at various times, and will be found noticed in this Journal, Vol. XV., page 114. We call attention to this astringent gum, as it is again being tried medicinally. It is also alluded to in Bentley's 'Manual of Botany,' page 553.

Chlorate of Potash Tablets.—The following is the formula for Mr. Dethan's tablets, recommended for counteracting fœtor of the breath:—Take Potassæ Chloratis ʒiiss.; Balsam Tolutani, ʒss.; Alcohol q. s. in ft. solutio; Sacchari pulveris ʒ x; Mucilaginis q. s. Prepare a homogeneous paste, and divide into fifty tablets.

Death from the Administration of Chloroform.—On Monday, June 2nd, an investigation was resumed at the Dock Hotel, East Smithfield, by Mr. Walthew, the Deputy Coroner for East Middlesex, touching the death of Pierre Dumenil, aged thirty-three, who expired under the influence of chloroform, and whose body was exhumed by order of the Coroner. Mr. F. J. Gant, F.R.C.S., stated in evidence that it was most hazardous to give a person whose lungs and heart were so diseased chloroform; and that in consequence of the uncertainty in the administration of chloroform, he always gave it by instrument. Dr. Kidd said that chloroform was given every day most improperly. Dr. Alfred Dieudonné, who administered the chloroform, stated that he examined the deceased three times before giving the chloroform, and that six persons were present. He had been in the habit of giving chloroform in the Paris Hospitals from 1849 to 1857, had also given it in London, and never had a fatal

case before. The Coroner, in summing up, said that Dr. Dieudonné had examined the state of deceased before applying the chloroform, and as there had been no negligence, no blame could attach to Dr. Dieudonné. The jury returned the following verdict :— "That deceased died from the effects of chloroform administered at his own request, and that his death was caused by misadventure."

Poisoning by Cyanide of Potassium.—On Friday, May 24th, John Lemon was brought before Mr. Corrie, at the Bow Street Police Court, charged on suspicion of being concerned in the death of Ann Gedling, aged forty-five, who it was alleged had died from the effects of cyanide of potassium. At the inquest held by Mr. Bedford, coroner, at the St. Martin's Vestry Room, evidence was adduced to the effect that after a drunken quarrel with the man, John Lemon, who was a dealer in counterfeit coins, the deceased drank a quantity of solution of cyanide of potassium, which was used by the prisoner in his trade. The jury did not appear to be satisfied with the evidence, and returned the following verdict :—"That the deceased died from the effects of the poison, but there was no evidence to show how it came into the system." The prisoner was subsequently discharged on the evidence of the medical witness, Mr. Lovett, who was of opinion that the deceased had mistaken the bottle of cyanide of potassium for a bottle of gin, which was in the same room, and had taken a draught of the former, whereby she had poisoned herself.

Accidental Poisoning.—On Saturday evening, May 17th, an inquest was held by Mr. Bedford, the Westminster Coroner, at 26, Lower Eaton Street, Belgrave Square, touching the death of Mr. George Corsham, aged fifty-four, gas-fitter, at the above-mentioned address. Miss Louisa Harold deposed that she had been living with the deceased as his housekeeper for the last two years. On Monday, May 12th, he was attacked with great pains in his knees, and the following day she went at his request to his medical adviser, Mr. Davies, 17, Lower Belgrave Street, who prescribed. On Wednesday Mr. Davies visited him, and on Thursday two bottles were received from that gentleman, one containing embrocation for external application, and the other a draught to be taken internally. No label was on the embrocation bottle, and neither did any one apprise her that it was poison. On Friday morning at seven she gave deceased the embrocation, under the erroneous impression that it was the draught, and immediately after he had swallowed it he exclaimed, "What have you given me ?" and called anxiously for castor-oil. Witness looked round, and, having discovered the terrible mistake she had committed, rushed off for castor-oil and then for Mr. Davies, who soon after arrived. She was sure the mistake would not have been committed had the bottle been labelled "poison." Mr. Davies deposed that upon his arrival he found Mr. Corsham suffering from the effects of poison, and adopted the usual remedies, but death shortly afterwards ensued, and he had not the slightest doubt that it was solely occasioned from the embrocation, which was a deadly poison. He acknowledged that the bottle was not labelled poison, but submitted that it bore a label intimating that it was for external application only. After some deliberation, the jury returned a verdict "That deceased died from poison contained in an embrocation administered by mistake for medicine, the party not being aware that it contained poison, no indication of that kind being on the bottle."

Alleged Poisoning by Arsenical Paper-hangings.—Four children have died at Limehouse from the effects, it is said, of arsenical paperhangings. A short time since one of the children was unwell, and Mr. Horten, a surgeon of the district, was called in, and he pronounced the child to be suffering from diphtheria, from which it died, and the death was registered accordingly. The other children died at intervals in rather rapid succession, but previous to the death of the fourth child, Dr. Orton, the medical officer, was called in, and was requested to make an inspection of the house, which he found to be in good condition ; but the walls of the room where the children played was found to be covered with an arsenical paper, and this led to the supposition by Dr. Orton that arsenic might have been the cause of death. On Wednesday, April 30, the investigation before Mr. Humphreys, the Coroner for Middlesex, was resumed, when Dr. Orton stated that he found the child, Amelia Turner, suffering from extreme prostration, and was unable to account for the symptoms, but having noticed the green paper on the wall he could see a marked connection be-

tween the symptoms exhibited by the deceased and the other children, and those caused by arsenical poisoning. He made a *post-mortem* examination, but found no traces of disease to account for death. Dr. Letheby analysed the paper, which was found to contain arsenic in the proportion of three grains to the square inch; he also examined the stomach and viscera, but could find no arsenic, yet, in the absence of disease, he thought death might have been caused by arsenic. Owing to the absorption of the poison being gradual, he thought it possible that the traces might be wanting, though the effect would be fatal. Dr. Orton, on being recalled, stated that he had no hesitation in saying that death was caused by chronic poisoning by arsenic. The coroner summed up, and the jury, after a brief consultation, returned a verdict of "Natural Death." The coroner said it was a question whether he could take this verdict. He could not refrain from expressing his entire dissent from the conclusion to which the jurors had come. The medical evidence showed that there was not only no disease to account for death, but that there were no traces of disease. A juror said that the jury were willing to admit that the use of green paper was objectionable, although they were of opinion that in this case death was natural.

Poisoning by Aniline.—The following case is recorded by Samuel Knaggs, Esq., M.R.C.S., in the 'Medical Times and Gazette' of June 7th, 1852:—The man, who was thirty-nine years of age and healthy, was employed in some chemical works in Huddersfield. About noon he was directed to empty four carboys of the nitrate of benzole into a still; and by mistake the last one contained aniline, which is made from the nitrate of benzole. On lifting this carboy, it struck against the edge of the still, and broke: the whole contents poured over him, and into the ground beneath. None got into his mouth, but the fumes were very freely inhaled. Being anxious to conceal this accident from the knowledge of his employer, he worked hard to remove all traces of it; but in about an hour he was compelled to desist, for "he broke out into a sweat, and felt quite giddy and weak in the head and stomach." He then sat down for half an hour, and walked into the open air and had some tea. Afterwards he returned to the still and again tried to scrape up the spilt aniline, but the fume was too much for him. He felt very ill and unable to work; but he stayed till about five o'clock, when he walked across the road to his home, and went to bed immediately, "feeling very bad in his head and chest." He gradually got worse, and about nine o'clock a medical man saw him. At 11 p.m. I received an urgent message, begging me to come immediately, as he was dying. On entering his cottage I found him in bed apparently at the last gasp. His face and whole body was of a livid, leaden hue; the lips, gums, tongue, and eyes of a corpse-like bluish pallor; he was taking a gasping breath, as I thought for about the last time. I poured instantly two ounces of brandy down his throat, and then used cold affusion liberally with very good effect. After this I had his chest, legs, and thighs covered with mustard plasters, and for three hours he took ʒss. of brandy every quarter of an hour, and at the seventh minute a strong dose of ammonia and chloric ether; whilst with every third or fourth inspiration I made him inhale strong ammonia. During all this period there was no convulsion; he was perfectly sensible, and able to give a correct account of his feelings, and of the accident. His pulse was extremely small and irregular; but it became fuller under the use of these means, and reached 130. He complained only of the pain in the head and chest, and latterly of the mustard. At the end of three hours the sinapisms were removed, and though the mustard was very good the skin was not at all reddened. I then left him for the night, ordering ʒss. of brandy to be given him every half-hour, to alternate as before with the ammonia and chloric ether, and to inhale ammonia frequently. This plan was pursued throughout the night, and by the next morning his livid hue was fading, and he soon got quite well again. The legs, however, being blistered and painful from the mustard, kept him in bed for some days.

Accidental Poisoning by Decoction of Poppy.—Mr. Humphreys, coroner, held an inquest on Wednesday, June 18th, at the Old Vineyard House, Coppice-row, Clerkenwell, on William Watford, aged one month, the son of an excavator, living at 1, Vineyard-gardens, who died from an overdose of decoction of poppy made from a poppy-head. The deceased child was taken poorly, and the mother went to buy some poppy-flowers, believing they would do him good; but, being unable to get the flowers,

she bought him a poppy-head, which she boiled, and gave several spoonfuls of the decoction to the deceased child, who soon afterwards fell asleep. At one o'clock the following day, the mother, finding the child did not awake, called to a woman lodging in the same house. They found him in a lifeless state, put him into a warm bath, and afterwards discovered that death had taken place.—A verdict was recorded of accidental poisoning, with a severe censure upon the mother for her careless conduct in the matter.

Poisoning by Strychnine.—At the adjourned inquest held on Friday, June 6th, before Serjeant Payne, the Coroner for the City of London, on the bodies of Annie Howard Vyse and Alice Kate Vyse, Mr. John Attfield, Demonstrator of Practical Chemistry at St. Bartholomew's Hospital, gave the following evidence :—On the 28th of May I received the contents of the stomachs of the two children from Mr. Savory, in distinct jars, sealed, and I have since analysed them. As regards that of the elder child, by certain chymical operations I obtained from the matter a small quantity of a substance which I knew would be strychnine, more or less pure, if strychnine had been in the stomach at all. That substance answered to all the tests for strychnine. I therefore say that strychnine was found in the contents of the elder child's stomach. I cannot speak definitely to the quantity found; that would be the residue, after some strychnine had been absorbed into the system. I also examined the liver of the elder, and found it to contain strychnine. The stomach of the younger child I examined in the same way, and found strychnine in it, and likewise in the liver. I have examined some of Battle's Vermin Powder, given to me by Mr. Savory. I also purchased a shilling, a sixpenny, and a threepenny packet of the same powder at Messrs. Edwards's, in St. Paul's Churchyard, which I have since analysed. The shilling packet contained an average of 60 grains of powder, the sixpenny packet an average of 25 grains of powder, and the threepenny packet an average of 15 grains. Battle's Vermin Powder I find to consist of starch, sugar, Prussian blue, and strychnine, the strychnine being in the proportion of 10 per cent. of the powder.

In compliance with the wish of one of the jury, Mr. Attfield gave a detailed account of the various tests he had used in the analysis. A verdict was returned to the following effect :—"That Annie Howard Vyse and Alice Kate Vyse died by poison, administered to them by their mother, Ann Cornish Vyse."

Poisoning by Opium.—An inquest was held on Thursday, June 12th, before Mr. W. Carter, Coroner for West Surrey, at the Lord Nelson Tavern, Nelson Square, on the bodies of Joseph Mockford and his two children. It would appear that the father first poisoned the children, and then committed suicide by stabbing himself in the abdomen. According to the evidence adduced, the man Mockford, who filled a confidential situation, occupied apartments at No. 189, Blackfriars Road, where the bodies were found on Tuesday, June 10th. A *post-mortem* examination of the bodies was made by Mr. James V. Henderson, surgeon, but no analysis appears to have been attempted. Mr. Henderson was of opinion that the children were poisoned, but death might have been produced by the compression of the pillows over their faces before the poison had time to act. A phial was found on the floor, near the bodies of the children, which in the opinion of the medical witness had contained a preparation of opium, and another phial on the drawers containing a small quantity of brownish liquid, supposed to be methylated tincture of opium. Several witnesses spoke to the effect produced on the deceased by the loss of his wife in April last. The jury unanimously agreed that no further evidence was necessary, and the following verdict was returned :—"That the children were wilfully murdered by their father, who immediately afterwards destroyed his own life while in a state of mental aberration."

Poisoning by Chloroform.—A case is described in the 'Medical Gazette' of a gentleman who has been suffering from debility and depression of spirits, having swallowed two ounces of pure chloroform at eight o'clock A.M. on April 6. As he was generally late in rising, his friends were not surprised at his sleeping beyond the usual hour, and he was allowed to remain in this state till three P.M.; when, on discovering the empty chloroform-bottle, medical aid was obtained. He was found in a state of deep coma; the pupils widely dilated, and insensible; pulse slow and feeble. A quantity of chloroform, mucous, and watery fluid was removed by means of the stomach-pump. The patient soon showed signs of returning consciousness, and in

less than an hour could give rational answers to questions put to him. For three or four days he complained of a burning sensation in the throat and epigastrium.

Suicide by Sulphuric Ether.—An inquest was held on Thursday, June 5, before Mr. Humphreys, the Coroner, at the Elephant and Castle Tavern, King's Road, Camden Town, on the body of Gaetano de Lauretés, aged forty, a professor of music, who committed suicide at his lodgings in Charlotte Street, Fitzroy Square, on Monday, June 2. It appeared from the evidence that he had been charged with felony for having obtained money on letters which purported to have been signed by several members of the Italian Government. He was accompanied to his lodgings by Mr. Shaen, a solicitor, and while examining some documents he was observed to swallow the contents of a bottle; he threw himself on the bed, and almost instantly expired. A *post-mortem* examination was made by Mr. Wildore, surgeon, who believed that the deceased had died from taking sulphuric ether. The jury returned a verdict of "Temporary insanity."

Suicide by Laudanum.—An inquest was held on Tuesday, May 20th, at the One Bell Tavern, St. George's-in-the-East, by Mr. Humphreys, on the body of John Noller, aged fifty-four, a builder, who committed suicide by swallowing a large quantity of laudanum. Mrs. Sophia Knoller said that deceased was subject to gout, and was a hard drinker. About three weeks ago he expected a large sum of money, but it was not paid, and he took it much to heart. He bought an ounce of laudanum, and took the whole of it in a little brandy, but it had only the effect of causing him to sleep for twenty-four hours. On Saturday night, May 17th, after getting into bed, he exclaimed, "I think that will do it at last." Witness taxed him with having taken laudanum again, but he denied having done so; but upon her going to a chemist in the neighbourhood of deceased's residence, she found that he had bought a half-pint of laudanum that afternoon. Deceased said that he had hardly drunk any of the poison, and had thrown the bottle out of the window. He then fell into a profound sleep, and witness became alarmed, and sent for Dr. Mahoney, who prescribed for him; but he died on the Sunday morning. Dr. Mahoney said that the quantity of the poison taken was sufficient to kill several men, and he could only account for its not destroying the deceased's life at once by the supposition that the brandy which he had apparently mixed with it had delayed its effect. The coroner condemned the want of caution evinced in selling so large a quantity of poison to deceased. The jury returned a verdict of "Suicide while in a state of unsound mind."

TO CORRESPONDENTS.

S. A. L. S. S. (Madeley).—*Portland Cement* is made by calcining together limestone and some argillaceous earth, the result being a mass which most rapidly absorbs a certain quantity of water, and then becomes solid as a hydrous silicate of lime.—Ure's 'Dictionary of Arts,' etc.

Doubtful (Liverpool).—No.

A. P. S. (Ormskirk).—*Violet Powder* consists of wheat starch, scented according to fancy. The following is a good formula:—Powdered starch, 7 ounces; orris powder, 1 ounce; otto of roses, 1 drop; essence of bergamot, 8 drops.

Pharmacien (Manchester).—We recommend our correspondent to apply to any of the medical agents. Assistants going to the colonies without any definite engagement should go prepared, if not successful in obtaining the situation they desire, to turn to some other employment.

H. S. T. (Lewes).—1. Under the conditions described, we should consider the aquarium to be in a healthy condition. 2. Bowman's 'Medical Chemistry.'

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, Elias Bremridge, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. II.—AUGUST 1st, 1862.

THE JURIES BILL.

We alluded in our last Number to a bill before Parliament relating to the summoning of Juries, and stated that a proposition had been made to introduce a clause exempting Chemists and Druggists from the liability to serve on Juries. The reasonableness of such an exemption, on the ground of its promoting the safety of the public in the administration of medicine, was admitted by many members of the Legislature, but it was found difficult to define who was a Chemist and Druggist. This difficulty was overcome by confining the exemption to registered Pharmaceutical Chemists, and at the same time in limiting the exemptions to a less numerous body another objection was met, which was founded upon the large reduction that would be made in the Jury-Lists, if all those who call themselves Chemists and Druggists were struck out. This proposition assumed a more definite form than that first suggested, and a clause was prepared to the effect that, "All persons duly registered as Pharmaceutical Chemists according to the provisions of an Act intituled 'An Act for Regulating the Qualifications of Pharmaceutical Chemists' shall be and are hereby absolutely freed and exempted from being returned and from serving upon any Juries or Inquests whatsoever, and shall not be inserted in the lists to be prepared by virtue of the principal Act or of this Act." This clause was proposed to be introduced into the Bill while passing the Committee in the House of Commons; and although it was brought forward at a short notice, many Members of the House promised their support to it, and no opposition was anticipated, until, on the 27th of June, when Mr. Powell moved, in pursuance of notice, that the above clause be introduced, the motion was opposed by Sir George Grey, who stated that as the Bill related ostensibly to the *mode* of summoning Juries, it was not a suitable occasion for exempting persons from serving on juries, but if Pharmaceutical Chemists ought to be exempted, this should be effected by a Bill introduced for that purpose. At the same time he thought such exemption would not be desirable, as it would withdraw a large number of intelligent men from the Jury-Lists, which of itself would be an evil.

In the face of this opposition the motion was not pressed to a division, and

the Bill therefore passed the Commons without the proposed clause. It was discovered afterwards, however, that although the Commons objected to the exemption of Pharmaceutical Chemists, and rejected the clause for effecting that object, they at the same time introduced a clause exempting "all managing clerks to attorneys, solicitors, and proctors actually practising, and all subordinate officers in gaols and houses of correction."

This result of the efforts which have been made to obtain a privilege which it was thought a body of educated Pharmaceutical Chemists were as much entitled to as lawyers' clerks, was unexpected, and certainly was a great disappointment.

When the Bill went into the House of Lords a petition was presented from the Council of the Pharmaceutical Society praying their Lordships to extend to Pharmaceutical Chemists the privilege they had in vain asked for of the Commons. The justice of the claim having been admitted by several noble lords, including Lord Chelmsford and Lord Portman, who had charge of the Bill in the Upper House, a clause similar in effect to that previously proposed in the House of Commons was introduced in the Lords' Committee, and this was passed through the House without any opposition. The exemption, however, was now made to comprise veterinary surgeons as well as Pharmaceutical Chemists.

As no opposition to these exemptions was in the slightest degree hinted at during the progress of the bill through the House of Lords, it was hoped the Commons would accept the Bill in the form in which it was returned to them, especially as they had already sanctioned the introduction of exemptions by exempting lawyers' clerks.

A petition was presented to the House of Commons as had previously been done to the House of Lords, from the Council of the Pharmaceutical Society, and interest was made with members of the House by our Local Secretaries and others throughout the country. Unfortunately the objection of the Secretary of State had not been removed, and the ground of his objection being in one respect strengthened by the addition of a new class of men, namely veterinary surgeons, for whom exemption was asked, Sir George Grey again appeared in opposition to our claim, and having moved the non-confirmation of the Lords' amendments, he carried this by the casting vote of the Speaker, the numbers on a division being fifty-three for and fifty-three against the motion.

Thus stands the question at the time of our going to press. We have the unanimous decision of the House of Lords in our favour, and an equal division of the Commons for and against us. Whether the Lords will adhere to their amendments, whether the Commons under the peculiar circumstances of the division in their House will concede the point in question, or whether a compromise will take place between the two Houses, so as to retain some and omit others of the exempted parties, remains to be decided, and a few days now will reveal the result.

Whatever the decision of the Legislature may be on this occasion, our experience in connection with it ought to afford instructive lessons with reference to the future. If we fail now to obtain the object for which we have sought, we shall not retire from the application dispirited or unprepared for another attempt. On the contrary, all that has occurred tends to strengthen our convictions in the justice of our claims, and, it is to be hoped, will stimulate us to renewed and more energetic exertions when a suitable occasion shall again present itself.

ON THE NEW WEIGHTS PROPOSED TO BE USED IN MEDICINE.

When the Pharmacopœia Committee of the Medical Council entered upon their duties in 1858, one of the questions which they had to direct their attention to at an early period was that relating to the weights and measures, the use of which should be ordered in the British Pharmacopœia. The weights then used by the three British Colleges of Physicians were not alike. The London and Edinburgh Colleges used the apothecaries' weights, the pound, ounce and grain of which coincided with the troy weights, while the Dublin College used a system which they introduced in 1850, in which the pound and ounce were avoirdupois, while the grain was troy and the drachm and scruple differed from anything previously existing. As the Pharmacopœias of the three Colleges were to be united into one, it was obvious that a new system of weights would have to be imposed upon at least one of the Colleges, and the question necessarily arose as to the nature of the change to be made, or of the system to be adopted. Several propositions were made, among which was one by Mr. Squire, and another by Mr. Warington, which will be found at pages 568 and 570 of Vol. XVIII. of this Journal, and another subsequently by Dr. Charles Wilson, of Edinburgh, which is fully described at page 18, Vol. I. (2nd Series), of this Journal. The subject occupied a good deal of the attention of the Pharmaceutical Society at that time; and after being fully discussed at two meetings of the Society, at one of which Dr. Wilson was present, the following resolutions were passed :—

1. "That the opinion of the Pharmaceutical Society, expressed at this public meeting, is strongly opposed to any change in the weights now used in medicine, and especially if such change should alter the value of the grain; at the same time they deem it would be desirable to place side by side the equivalents of the English and metrical weights, as suggested by Mr. Squire."

2. "That after a lengthened and lucid explanation by Dr. Wilson of the proposed change to the avoirdupois system, which succeeds in equalizing the weights and measures, but alters the value of the grain, this meeting is not convinced of the desirability of such change, and must adhere to the opinion unanimously passed at the last meeting specially convened for the consideration of the question."

The decision come to by the Pharmacopœia Committee of the Medical Council was to a different effect. At a conference of the three Pharmacopœia sub-committees for England, Scotland and Ireland, an opinion was expressed which was favourable to the adoption of Dr. Wilson's proposition; and from that time until the present it has been understood that the system of weights suggested by Dr. Wilson was to be used in the new British Pharmacopœia. According to this system the pound and ounce were to be those of the avoir-

dupois weight, while the subdivisions of the ounce were to correspond with those of the present apothecaries' weight, the ounce being divided into eight drachms, the drachm into three scruples, and the scruple into twenty grains. These latter denominations of weight, while corresponding in name with weights previously existing, would differ from such weights in value. The new grain would be 0·91145 of a troy grain.

Objections have been urged against this system from several quarters, and especially on a recent occasion from the London College of Physicians, who at a Comitia passed, almost unanimously, the following resolution :—

"It having come to the knowledge of this College that in the new Pharmacopœia intended for publication under the authority of the General Medical Council it has been contemplated to introduce a new grain, differing from the standard grain weight of the country, the College is of opinion that however desirable it may be to substitute the avoirdupois pound for the troy pound, it is *not* desirable to introduce a new grain differing from the standard grain, which has been so long in general use and is established by Act of Parliament."

Corresponding with the opinion thus expressed, is that more fully stated in a communication which has been published by Dr. G. E. Paget, of Cambridge, as follows :—

"It is generally understood that the committee for the preparation of a National Pharmacopœia have come to a resolution to make a complete change in the weights for pharmaceutical purposes. The avoirdupois pound and ounce are to be substituted for the troy pound and ounce, which have hitherto been used in apothecaries' weight; and a new drachm, a new scruple, and a new grain, are to be established.

"The former of these changes is manifestly desirable. The avoirdupois pound has, by recent enactment, become the standard imperial weight; and the avoirdupois pound and ounce are those which have long been used in all mercantile transactions, except those of goldsmiths and jewellers. They are the weights which are used by manufacturing chemists, as by all other manufacturers; and their adoption for the dispensing of drugs would do away with the ambiguity and inconvenience arising out of the use of two different sets of weights by manufacturing and dispensing chemists.

"The substitution, therefore, of the pound avoirdupois for the pound troy, may be hailed as a sensible improvement; and the corresponding change in the ounce might be allowed to pass unquestioned. But the change in the values of the drachm and scruple is less free from objection; and the establishment of a new grain appears to me to introduce inconveniences greater than those which it is intended to remove.

"The object of the Pharmacopœia Committee, in proposing to establish a new grain, seems to be this : to make the avoirdupois ounce divisible into 480 *integral* parts, like the troy or apothecaries' ounce. The latter, as everybody knows, contains 480 standard grains. But the avoirdupois ounce contains only 437·5 standard grains; so that if this be divided, like the apothecaries' ounce, into drachms and scruples, each drachm will contain 54·6875 standard grains, and each scruple will contain 18·2291666... standard grains.

"These, then, will be the actual weights of the proposed new drachm and scruple. But, in order to make the scruple divisible into 20 grains, the drachm into 60, and the ounce into 480 grains, as heretofore, the Committee propose to establish a *new* grain, which shall be lighter than the standard grain, in the proportion of 91 to 100.

"To the establishment of this new grain there are objections which seem to me deserving of consideration. The present standard grain has been formally established by Act of Parliament, being defined as the seven-thousandth part

of the standard pound deposited in the Exchequer office. It is not only in actual use for medicines and the precious metals, and in scientific investigations, but has been in use for ages, and is known and understood both at home and in foreign countries as our standard grain. It will, of course, continue to be used by men of science in their experiments and calculations.

"The establishment of a new grain, to be used for drugs alone, would have the effect of making diverse what is now common between medicine and other sciences. This will not be a mere temporary inconvenience; it will occasion an ever-recurring ambiguity. When we meet with statements of weight in grains in medical, physiological, or chemical investigations, we may be left in doubt which kind of grain is meant, the standard or the new grain; and this is a doubt which calculation will not solve.

"Besides, for the honour of medicine, is it advisable to sever any of its bonds of connection with the more exact sciences? Shall we not be blamed for it by men of science? and shall we not be liable to incur ridicule, if, while remedying the ambiguity of the pounds and ounces, we create ambiguities of the same kind and greater in degree?

"It may be added, as a minor objection, that the new grain, if it be the four-hundred-and-eightieth part of an ounce avoirdupois, will not be ·91 of standard grain, but the long recurring decimal ·911458333... If the new grain be ·91 standard grain, 480 new grains will not make exactly an ounce avoirdupois. The difference is unimportant in the dispensing of drugs, but not so in scientific investigations; and a *reform* involving such an error of calculation would do little credit to medical accuracy.

"These are not the only objections to the proposed change. The new drachm and scruple will be different from the drachm and scruple heretofore used. The names will be preserved, but will not have the same meaning; and hence will arise further ambiguities and inaccuracies.

"With regard to the drachm, there will moreover be this strange inconsistency: it will be the eighth part of an ounce avoirdupois, and will therefore be exactly twice as heavy as another weight of the very *same name*, viz. the drachm avoirdupois, which is the sixteenth part of the same ounce.

"One of the immediate consequences of the proposed change will be, that an entirely new set of brass weights will be required by every general practitioner and druggist in the kingdom; all the old weights will become valueless.

"Be it observed, that the inconveniences which have thus been pointed out are not the immediate consequence of the praiseworthy aim of the committee to get rid of the confusion between the two ancient sets of weights—the troy and avoirdupois pounds and ounces; they are not the *necessary* consequence of substituting these avoirdupois weights for the corresponding troy weights, but are the consequence of an endeavour to effect the division of the ounce avoirdupois into 480 integral parts. It seems to me that this object is not of so essential an importance as to justify the introducing new elements of confusion into our English system of weights.

"It may, perhaps, be worth while to point out a plan by which all these inconveniences might be avoided. This may be done simply by ceasing to use the ounce in prescriptions; of course, I mean the ounce in weight, not the fluid-ounce, which is a measure, and with which it is unnecessary to interfere. Let the quantities of solid substances be prescribed in drachms, scruples, and standard grains, such as are now in daily use. When larger quantities are required, they can be written in drachms; or, if of the largest kind, may be expressed by the pound of 7000 grains, which is an exact multiple of the drachm.

"Perhaps a still better (and the simplest) plan would be, for all quantities less than a pound, to prescribe in grains alone—*in standard grains alone.*

The calculations between large and small quantities would always be easy, because the standard pound is a large round number (7000) of grains. We should have weights of 100, 200, 500, and 1000 grains, such as are now occasionally used in scientific investigations. There would be no difficulty in writing our prescriptions. The small quantities, which more commonly occur in prescriptions, would require no alteration from our present forms, and for even the largest quantities the change would be easy. Five hundred grains (gr. D) is as easily written as ℥j. Fifty, or a hundred, or a thousand grains, are likewise easily written, either in the ordinary figures, or as gr. L, gr. C, or gr. M.

"As the grain would not be changed, *all the brass weights now in use for dispensing might still be used.* A single ordinary set of the small weights might be made to serve for dispensing any drug not exceeding 250 grains in weight.

"If any new weights were needed, they would be one of 300 grains and one of 500 grains; and these would only be required in cases in which ounce weights are now used. No other weights would be needed for dispensing and compounding on a moderate scale; and if larger weights were needed, they would be the ordinary avoirdupois pound, half-pound, and quarter, which are in common use in every shop and most private houses, and which weigh respectively 7000, 3500, and 1750 grains.

"As the intentions of the *Pharmacopœia* Committee have not yet been published *on authority*, my remarks may appear premature. But the intentions are well known; and to wait for their authoritative publication is to wait until it might be difficult or impracticable to have them reconsidered."

While these discussions and controversies have been taking place among those connected with the medical profession, the subject of weights and measures has been occupying the attention of Parliament. The select committee on weights and measures, presided over by Mr. William Ewart, and of which also Mr. Cobden has been an active member, has recently reported the results of their investigation to the House of Commons. Evidence is adduced in this report which shows the great advantages that would result from the adoption of one uniform system of weights and measures throughout all countries, and the almost unanimous recognition, by eminent men of all countries, of the French metrical system as that best suited for general adoption.

The committee recommend the gradual introduction, under suitable regulations, of the metrical system of weights and measures in this country. They think the first step should be simply to render it permissive. No compulsory measures should be resorted to until they are sanctioned by the general conviction of the public. They recommend that a department of weights and measures should be established under the Board of Trade, and that to this department should be confided the gradual introduction of the metrical system. It is proposed that Government should require its employment in their contracts, so as to familiarize merchants and manufacturers with its use, and that it should be referred to in the competitive examinations for the Civil Service. In these and other similar ways it is thought that the way might be prepared for the ultimate adoption at some future time of the metrical system, which has already been wholly or partially brought into use in France, Holland, Belgium, Sardinia, Tuscany, Spain, Portugal, and Switzerland.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 2*nd July*, 1862,

Present—Messrs. Bird, Deane, G. Edwards, Evans, Hanbury, Haselden, Hills, Lescher, Meggeson, Morson, Sandford, Savage, Squire, and Waugh,—the following were elected

MEMBERS.

CHELTENHAM .....Street, Edward.
SIDMOUTH .....Chessall, Rowland.
CRANLEY .....Olliver, George Edward.

The following were also elected

HONORARY MEMBERS.

Balard, Antoine Jérôme ...Professor, College of France and Faculty of Science, Paris.
Frankland, Edward .....Ph. D., F.R.S., Foreign Secretary to the Chemical Society.
Neligan, James Moore .....M.D., M.R.I.A., Dublin.
Von Fehling .....Professor of Chemistry, Stuttgard.
Schrötter, A. .....Ph. D., General Secretary, Imperial Academy, Vienna.
Würtz, Adolphe .....M.D., Ecole de Médecine, Paris.
Stas, J. S. .....Member of the Department of Science, Royal Academy, Belgium.
Odling, William.....M.B., F.R.S., West Croydon.
Warington, Robert .....F.C.S., Apothecaries' Hall, London.
Parlatore, Filippo .....Professor of Botany, Royal Museum of Natural History, Florence.

MEETING OF THE COUNCIL, 9*th July*.

Present—Messrs. Hanbury, Haselden, Hills, Lescher, Sandford, Squire, and Waugh.

The Corporate Seal of the Society was affixed to a Petition to the House of Lords, praying the insertion of a Clause in the Juries Bill, exempting Pharmaceutical Chemists from serving on Juries.

MEETING OF THE COUNCIL, 23*rd July*.

Present—Messrs. Bird, Bottle, Davenport, Deane, G. Edwards, J. B. Edwards, Evans, Hanbury, Haselden, Herring, Hills, Meggeson, Morson, Sandford, Savage, Squire, Standring, and Waugh.

Mr. John Attfield, F.C.S., was elected Demonstrator of Chemistry and Pharmacy in the Society's Laboratory.

MAJOR EXAMINATION, 16*th July*.

Brown, Francis James .....Weston-super-Mare.
Hughes, Hugh Griffith .....Holyhead.
Whitfield, John .....York.

MINOR EXAMINATION.

Barton, Frederiek George .....Leicester.
Broughton, Samuel R.....Wrexham.
Chave, Francis William .....Uxbridge.
Earland, William .....Hay.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Mitchell, Robert Durno	Mr. Tabor	Salisbury.
Rogerson, Herbert Goldthorp	Mr. Rogerson	Bradford, Yorkshire.
Thorn, John James	Mr. Jackson	Crediton.

ERRATA.

Page iv. Barkley, William, prefix No. of Certificate "14."
xxxi. Parkinson, Robert, for "1847" read "1857," and prefix No. of Cert. "155."
xxxiv. Sawyer, Thomas, for "1853" read "1841."
lvi. Taylor, Henry Aylton, read "Taylor, Henry Hylton."

MEMBER OMITTED.

1847 Charsley, Nathaniel .....Brixton.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG.

(*Continued from p.* 14.)

IV. CAULOPHYLLUM THALICTROIDES, *MICHX.*—BLUE COHOSH.

HISTORY.—This plant has been employed for ages by the aboriginal inhabitants of North America as a remedial agent in the treatment of certain complaints incident to females. Its use as a parturient has been particularly alluded to by one writer, who says, that "a tea of the root is employed by pregnant females among the Chippeway Indians on Lake Superior, for some time before confinement, to facilitate parturition." The earliest colonists of North America gained a knowledge of its properties from the natives; and in certain districts it has long been a favourite remedy in domestic practice, and by irregular medical practitioners (more especially those of the class of Eclectics*) in the treatment of female complaints. It is said to have been tried with success lately by the regular medical practitioners of North America in similar diseases, and also as an antispasmodic, anthelmintic, diaphoretic, diuretic, etc., and quite recently it has been introduced to the notice of the profession in this country. It may probably turn out to be a valuable addition to our Materia Medica; but, under any circumstances, it is well worthy of an impartial and extended trial, as we have but few remedies of acknowledged and undoubted efficacy in some of the special diseases in which it is reputed to be useful.

SYNONYMS.—This plant is the *Leontice thalictroides*, Linn., Spr., and R. Br.; the *Caulophyllum thalictroides*, Michx. and Nutt. The name by which it is now more generally known to botanists, and the one by which it has been introduced to the notice of the medical profession, is *Caulophyllum thalictroides*, which we have accordingly adopted here. In common language it is known by the various names of Blue Cohosh, Squaw Root, Pappoose Root, etc. It must not be confounded with the *Podophyllum peltatum*, already de-

* Pharm. Journ. vol. iii. 2nd ser. p. 320.

scribed,* which is in like manner sometimes called Squaw Root and Black Cohosh. The generic name *Caulophyllum* is evidently derived from the two Greek words, καυλος, *a stem*, and φυλλον, *a leaf;* from the stem appearing to form a stalk for the single large and compound leaf which it commonly bears. The specific name *thalictroides*, signifying *thalictrum-like*, is indirectly derived from θαλλω, *to be green* or *flourishing*, and ειδος, *like*, from its general resemblance to the species of *Thalictrum*, a genus belonging to the Natural Order Ranunculaceæ.

Botany.—*Caulophyllum thalictroides* belongs to the Natural Order Berberideæ of Juss., De Cand., Endl., Meisn., and others; and to the Berberidaceæ of Lindley. The latter name will be here employed.

Generic Character.—Sepals 6. *Petals* 6, bearing a little scale within at the base. *Ovary* with 2–4 ovules. *Seeds* erect, globose; *albumen* horny. *Pericarp* indehiscent, or bursting at an early period, and exposing the finally drupe-like seed raised on its thickened funiculus.†

Specific Character.—Root perennial. *Stem* smooth, simple, 1–2 feet high. *Leaves* 3-ternate; the radical ones on long petioles; the *cauline* 1–2, destitute of a common petiole, the lower 3-ternate, the upper (when present) much smaller and 2-ternate, and placed at the very base of the terminal raceme or panicle. *Leaflets* 2–5-cleft at the apex, somewhat ovate, glaucous. *Panicle* small. *Petals* greenish-yellow; scale at the base reniform, viscid. *Seeds* large, 2 (or 1 by abortion), deep blue when ripe, on long and thick funiculi (baccate); *albumen* of the form of the seed, very firm. It flowers generally in April and May.‡

Habitat.—This plant is found in nearly all the North American States, more especially abounding in shady mountainous districts and moist situations. Torrey and Gray§ state, that it is found in woods from Canada to North Carolina and Kentucky.

Collection.—The rhizome and rootlets, which are the parts used in medicine, should be collected late in autumn, after the leaves have perished, or early in spring, just as the new leaves are appearing. The seeds, which have been used when roasted as a substitute for coffee, should, of course, be gathered when quite ripe.

General Characteristics.—The part employed in medicine is usually termed a root, but in reality it is the rhizome with its attached rootlets, like the so-called roots of *Podophyllum peltatum* and *Hydrastis canadensis* already described.‖ In commercial specimens the rootlets are usually in considerable proportion to the rhizomes, and firmly adherent to them. The rhizomes are either distinct, or two or more of them are adherent together, and form with their rootlets a dense entangled mass.

The *rhizome*, as found in commerce, varies in length and size. Commonly it is several inches long, much twisted and branched, and has a very irregular appearance. Its average thickness is about one-third of an inch, but it frequently much exceeds the latter dimension; while, in other cases again, it is of less diameter. Its upper surface is marked by transverse ridges, and presents at intervals prominences of a quarter of an inch or more in length. The latter elevations are the persistent bases of the aerial stems of former years. On most specimens of the rhizome we find also the decaying shri-

* Pharm. Journ. vol. iii. 2nd ser. p. 456.

† Torrey and Gray's 'Flora of North America,' vol. i. p. 52.

‡ Gray's 'Genera of the Plants of the United States,' vol. i. p. 81, and plate 32; Torrey and Gray's 'Flora of North America,' vol. i. p. 52; and Michaux, 'Flora,' vol. i. p. 205 and plate 21.

§ 'Flora of North America,' vol. i. p. 52.

‖ Pharm. Journ. vol. iii. 2nd ser. pp. 459 and 541.

velled remains of some of the aerial stems, which are of a yellowish-straw colour, and frequently three or more inches in length. A transverse section of the rhizome and permanent base of the aerial stem generally presents a somewhat waxy or resinous appearance, and we may readily distinguish an *internal layer* or meditullium of a yellowish-white colour, which forms the largest proportion of the section, an *external* or cortical portion of a yellowish-brown hue, and a *third layer* of a dark brown or blackish colour, separating the two former from each other. Externally, the rhizome is of a brownish-yellow colour.

From the lower surface and sides of the rhizome the *rootlets* arise. These are very numerous, and form a dense entangled tuft of commonly several inches in length. They are of a yellowish colour, and each rootlet consists of a small, central, tough, woody axis, of a yellowish-white colour, surrounded by an easily separable cortical portion. The taste of both rhizomes and rootlets is slightly bitter, and feebly aromatic and pungent. The odour of the same is strong, peculiar, and slightly aromatic. Both the taste and odour are most perceptible in the rootlets, which we should hence be led to regard as the most active portion.

In general appearance Caulophyllum rhizome resembles Serpentary and Valerian. It may be at once distinguished, however, from the *latter*, by the difference of odour: and from the *former*, by its less aromatic and otherwise peculiar odour; by the lighter colour of its rootlets; and by its greater size in comparison with its rootlets than is the case with similar parts of serpentary.

Composition and Chemical Characteristics.—No satisfactory analysis of Caulophyllum rhizome has as yet been published, but it is said to contain both a resinoid principle, which has been named *caulophyllin*, and an alkaloid, termed *caulophylla*. *Caulophyllin* is in extensive use as a remedial agent, being considered as the chief active principle of the plant. It may be prepared by precipitation from the concentrated tincture of Caulophyllum in a similar manner to that already described for the preparation of *cimicifugin** and *podophyllin*.† As the precipitate which is then formed is soluble to some extent in water, it is necessary to employ no more of that agent in the process than is absolutely necessary. The following process for obtaining caulophyllin by Dr. F. D. Hill, of Cincinnati, is given by Parrish.‡ "Exhaust the root of caulophyllum with alcohol, and obtain a thick fluid extract; add this to twice its volume of saturated aqueous solution of alum, and place it aside to rest for three or four days; then place it on a filter-cloth, and allow the water to filter through; wash the product two or three times with fresh water, and let the residuum dry in the open air: when dry, it readily forms a powder of a light greyish colour."

Caulophyllin, as it is commonly met with in this country, is of a brownish colour, but varying in this respect from a light greyish-brown to dark brown. It has a peculiar odour, and a bitter, slightly aromatic, and pungent taste. It is soluble to some extent in water, but insoluble in ether. In alcohol it is more soluble than in water. Parrish says,§ that the addition of a solution of ammonia renders it completely soluble in either of the three above-named menstrua, and that the solutions thus obtained are of a dark wine-colour. The author of 'Positive Medical Agents,' p. 116, states that the addition of a little nitric or hydrochloric acid increases its solubility in water.

The so-called alkaloid, which has been named *caulophylla*, does not appear to be essentially different from the above resinoid (*caulophyllin*). We have

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* Pharm. Journ. vol. ii. p. 462.
† Id. vol. iii. p. 461; and Parrish's 'Practical Pharmacy,' 2nd. edit. p. 191.
‡ Parrish's 'Practical Pharmacy,' 2nd edit. p. 194. § Id. p. 193.

ourselves, however, had no opportunities of examining it. It is said by Parrish,* to be prepared "from an aqueous infusion of the root, decolorized by animal charcoal, and concentrated *in vacuo* by adding infusion of galls, or 96 per cent. alcohol, collecting the precipitate, drying and powdering it."

An infusion of Caulophyllum, made by macerating for twenty-four hours, half an ounce of the mixed rhizome and rootlets previously bruised, in twelve ounces of boiling water, presented a yellowish-brown colour, a slighly bitter, and feebly aromatic and pungent taste, and a strong, peculiar odour. It exhibited, also, the following reactions:—*Blue litmus paper* was powerfully reddened; *solution of diacetate of lead* produced a milky appearance, and an abundant brownish-white precipitate; *tincture of iodine* caused a deep bluish-black coloration, but no very evident precipitate; *solutions of the perchloride* and *persulphate of iron*, a blackish-brown colour and slight precipitate; *solution of sulphate of copper* had no marked effect; *solution of chloride of barium* caused a brownish-white precipitate; *infusion of galls* produced no marked change at first, but ultimately caused a plentiful brownish precipitate; *solution of gelatine* had no effect; *solution of tartar emetic* lessened the colour, but caused no precipitate; *solution of ammonia* produced no marked change, which was also the case with *hydrochloric acid*. The addition of *nitric* and *sulphuric acids* to the infusion caused very evident changes: the *former* rendering it of a deep, bright, red colour, which gradually disappeared upon its being allowed to stand; and the *latter*, colouring it dark brown, and forming a floating, light, whitish-brown precipitate.

Neither the application of *solution of ammonia* or of *hydrochloric acid* to a clean section of a rootlet produced any marked effect. *Sulphuric acid* applied in like manner, simply darkened its natural colour; but *nitric acid* turned the central cord or meditullium to a bright red colour, while the cortical portion was not materially affected. The application of nitric acid to a section of the rhizome or persistent base of a former aerial stem, produced a reddish-brown colour over the whole surface.

Medicinal Properties and Uses.—The reputed properties and uses of the resinoid (*caulophyllin*), in which, as already observed, the medicinal value of Caulophyllum is said principally to reside, may be judged of from the following quotations from American writers. Upon these we offer no opinion, as caulophyllin has, at present, been but very little employed here. Dr. Grover Coe† says, that "it is antispasmodic, alterative, tonic, emmenagogue, parturifacient, diaphoretic, diuretic, and vermifuge; and that it may be employed in amenorrhœa, dysmenorrhœa, menorrhagia, leucorrhœa, gonorrhœa, to promote delivery, afterpains, dyspepsia, rheumatism, dropsy, hooping-cough, hiccough, hysteria, hysteritis, aphthous sore mouth, to expel worms, etc." The author of 'Positive Medical Agents' says, that, "in proper combination, the caulophyllin is a reliable parturifacient, but we cannot place it in a dozen classes of medicines, as others have done. It really is a stimulating tonic, and, as such, in every way perfectly reliable. It seems also to possess slight narcotic properties. Its continual administration will undoubtedly improve the general health, and thus give a healthy tone to the uterine function; and it will also, when pushed vigorously, exert a special action over the uterus, though we do not consider it (as an abortive) superior to either ergot or oil of savin."‡ Dr. Lee says,§ "Our experience satisfies us that it is a very efficient remedy, possessing diaphoretic, diuretic, and anthelmintic properties; that it exerts a

* Parrish's 'Practical Pharmacy,' p. 194.
† 'Concentrated Organic Medicines,' 3rd edit. p. 278.
‡ 'Positive Medical Agents,' p. 116.
§ 'American Journal of Materia Medica,' vol. iii. 1861, p. 306; and 'Chemist and Druggist,' vol. iii. p. 190.

special influence over the uterine organs, and controls uterine contraction in a manner similar to ergot. It is also a remedy of known energy in dysmenorrhœa and amenorrhœa, as well as uterine leucorrhœa." He also says that, "In rheumatism it has been used with much success, especially in combination with small doses of iodide of potassium;" and that "In chorea it produces striking effects, being decidedly antispasmodic and tonic. In small doses, it restores tone to the digestive organs, while it improves and regulates the various secretions. In atonic dyspepsia it may be used to great advantage, though not to the exclusion of other remedies. The Eclectics employ it in amenorrhœa and hysteria; as a parturifacient; in leucorrhœa and gonorrhœa; in rheumatism and dropsy; in whooping-cough and asthma; in aphthous sore throat, and as a vermifuge; in passive hæmorrhage, congestive dysmenorrhœa, epilepsy, nervous headache, neuralgia, hypochondriasis, and as a general alterative." The same writer adds, "Of course its use is only empirical in many of these diseases, there being nothing in its physiological action to recommend it as a curative agent in them. I would, however, recommend its trial as an alterative in chronic uterine affections and derangements of the menstrual functions, as well as atony of the uterus, causing tedious parturition. There is great reason to believe that its powers in such cases are underrated. In some cases it may be associated with iron, in others with iodine, with advantage; but in all cases its use is to be continued for a considerable time."

Combined with podophyllin, caulophyllin is reputed to lessen the painful and unpleasant effects frequently caused by that remedy when administered alone.

The roasted seeds of *Caulophyllum thalictroides* have been much vaunted by some writers, as a substitute for coffee.

Administration, Preparations, and Doses.—Caulophyllum has been given in the form of Tincture, Infusion, and as a Fluid and Solid Extract; but its resinoid or resinoid extract (*caulophyllin*) is that preparation which is in most general use. An *ammoniated tincture* would be probably a most valuable preparation in many of the diseases for which caulophyllum is reputed to be efficacious. There are no recognised formulæ for any of its preparations, and we forbear therefore from quoting their doses, as such must necessarily vary much according to circumstances.

The ordinary dose of *caulophyllin* is, from one fourth of a grain to one grain three or four times a day, as a tonic and alterative. Dr. Coe, however, gives it in much larger doses; thus, he says,* "The average dose of caulophyllin is three grains, and when used for the purposes of an antispasmodic, from five to ten grains may be given with advantage." This quantity, he adds, "may be repeated every hour or two with perfect safety, and, indeed, in many cases, it will be requisite to do so in order to accomplish the end in view." As a parturient after the commencement of labour,† it is generally administered in doses of from two to four grains, at intervals of from fifteen to thirty minutes.

IN RE GRANULATION.

"Spero meliora."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—It is with some hesitation that I beg a small space for the insertion of a few words more upon a subject which has already, upon three previous occasions, occupied

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* 'Concentrated Organic Medicines,' p. 278.

† Parrish's 'Practical Pharmacy,' 2nd edit., p. 194.

the pages of this Journal; but I strongly feel that the letters of your Liverpool correspondents upon that subject call for some reply; they almost seem to say, "We pause for a reply." Now, as an old offender and contributor, I venture to submit my answer. As in most matters we find good and evil combined, and as we admire the one and show our distaste for the other, so did I as far as I consistently could give that praise which I considered the ingenuity employed, and the advantage gained, in peculiar instances deserved, and express my disapproval of that which I conceived to be injudicious in the granulation of medicines; and from the general tenor of my former opinion I at present see no cause to dissent.

I must own to having overlooked the few words in Dr. Skinner's paper relative to the "Extempore granular powders;" but I may well be excused for so doing after reading the following:—"Officinal or not, compound powders may be kept on stock, or they may be dispensed from the various individual granules of the same size as that of which the compound powder is made up; and again, as *all* the various *officinal* and *other* pill masses are capable of being as *easily* granulated as powders, it is not improbable that, to some extent at least, pills may become an all but obsolete form of administering medicines." From these remarks, it is very evident that a tolerably wholesale introduction of the system was intended. With respect to young children who had passed beyond the powder-giving age, they could undoubtedly swallow two or three small pills, silvered or coated with tolu, or by any of the recently introduced modes, as easily as granules; for what are the granulated powders and pill masses but very small pills prepared by different machinery to that at present in use, only that these very small pills or granules are not quite so round as the old ones? Now, that peculiar idiosyncrasy which might interfere with the granules, is precisely that which does interfere with pill swallowing, and *vice versâ;* therefore, with such patients some other method has to be adopted. For one moment call to mind how very few simple, or even compound, powders and pills are prescribed in their original condition unmixed with others, and how rarely physicians and surgeons order the same powder or pills similarly combined and equally proportioned; under such circumstances, every imaginable form must be kept to meet the possible demand, or variety of composition or proportion must speedily be arrested; in truth, sooner or later, as regards powders and pills, the prescriber must simply order such as are ready for him, or adhere to the old plan, or the patient must bear with loss of time and the inconvenience of waiting. Need I put the question, Is this compatible with general practice? Time, which develops all things, will finally settle the matter; if prescribers order granules, patients will swallow them, and Pharmaceutists will be prepared to dispense them: "palmam qui meruit ferat."

Permit me now to draw attention to a portion of Mr. Edwards's communication. The only argument he employs in favour of granules is, that he prefers "Granulated Gregory's powder" to "good old-fashioned brimstone and treacle;" whilst he playfully bids us "look out for the cat" because I have said, "that very few Pharmaceutical chemists possess the necessary conveniences for grinding and powdering." Is this true or not? And then proceeds Mr. Edwards with the inquiry, "Who prepares your morphia, your quinine, etc.? It must be very well known that it is not from any incompetency or lack of skill that these are not prepared by the retail Pharmaceutists, but because, *commercially* speaking, they can buy them better than they can make them; and it must likewise be equally known that certain manufacturers prepare some things more advantageously than others: one, for instance, claims morphia and its salts, another quinine, another crystalline products, another the purification and condensation of glycerine. But who first introduced these and many others: the wholesale manufacturer? No; the researches of private individuals, and sometimes even chance, has favoured the fortunate, and in many, if not most instances, the quantities originally produced, and for some time prepared, have been very small. Where shall the cause of their present condition of purity and perfection be sought for? In this fact, that intelligent and properly educated Pharmaceutical chemists have insisted upon having good and pure chemical products, even though they did not possess the necessary conveniences for preparing them, for with these preparations they can easily judge of and determine their quality, they being definite compounds. Let me ask, on the other hand, why do Pharmaceutists, wherever practicable, prefer making their own tinc-

tures, spirits, liquors, pill masses, vegetable extracts, ointments, etc., and powdering their own jalap, ipecacuanha, scammony, etc., when they can buy them nearly all for less than the original cost of the material, without any calculation for labour, fire, or wear and tear, simply because the quality of these cannot be so readily decided upon, and they would have to trust entirely (and which in most cases they might safely do) to the honour of those with whom they deal, and which, but for the ruinous competition in price, might invariably be the case. In thus expressing my opinion, freely perhaps, but still honestly, as I have ever endeavoured to do, I have not been actuated by any wish to undervalue the labours of others, or from any feeling of pettishness, as Dr. Skinner would imply, but with the belief that while granulated medicines offer but little real advantage to the public, they are detrimental in many ways to the interests of the whole body of dispensing pharmaceutists and chemists.

I am Sir, your faithful servant,

18, *Conduit Street, W., 7th July*, 1862. A. F. HASELDEN.

USE OF METHYLATED SPIRIT IN PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The subject of Methylated Spirit occupied a pretty large portion of your last number, but it is by no means exhausted.

For myself, I have a few more experiences to detail, and by your leave will do so on the same plan as last month, viz. calling things by their proper names, and giving publicity to prices and everything but the names of persons. Were we to undertake this subject under the shield of anonymous communications, but little good would be likely to result; and I conceive that it is worth incurring odium in some quarters to contribute one's quota towards exposing a great abuse.

You are aware that I forwarded, before the publication of the last Journal, some additional information about the disguises under which purified methylated spirit has been passing. Smuggler-like, it sails under false colours, and has for the past three months hauled down the "Sp. Ammon." flag, only to hoist an equally deceptive one, emblazoned "Sp. Æther. Nit."

On the 17th of April last, the Board of Inland Revenue issued a General Order, with additional regulations in respect of methylated spirit. The instructions given refer chiefly to the precautions to be taken at the time of mixing the naphtha with the spirit. The supervisors are also directed to ascertain whether druggists or others sell methylated spirit without a licence, or without the proper proportion of gum-resin.

But the most important part of the document is the last clause, viz.,—

"11. That supervisors immediately acquaint every person authorized to use methylated spirit that they are not at liberty to purify the spirit in any manner whatever, but must use it for the purpose sanctioned by the Board in the state in which it is received."

The effect of this General Order was soon seen in the issue of the following circular by a firm largely engaged in the purification of methylated spirit:—

". . . . . , 1*st May*, 1862.

"We beg leave to inform you that the Board of Inland Revenue have given us notice (see over) which will prevent us executing further orders for tinctures prepared with purified spirit.

"We hope to be favoured with a continuance of your commands for Spt. Ether. Nit., Spt. Ammon. Co., Ether. Chloric., Ether. Sulph., and Chloroform.

"Yours obediently,

". . . . . ."

(Annexed was a copy of Clause 11, as above.)

Some of your readers may ask, what more can be desired than this frank abandonment of the system? Nothing, certainly, provided that no other evil be substituted; but it happens that the supply of purified spirit has not been stopped, nor even checked, by the General Order.

The present mode of trading in cleaned methylated spirit is the following:—a dash of Sp. Ether. Nit. is added, just to flavour it; and whether this is a distinct addition, or a result obtained during the process of cleaning, is immaterial. The price of this article is about 9*s*. 6*d*. per gallon, and the consumer gets rid of the sweet spirit of nitre by a short exposure to the air; he then uses it for tinctures, and obtains results which give no clue to either naphtha or nitrous ether by the senses of taste or smell.

I have sent samples of such spirit and such tinctures to London, and they were laid before the Council of the Society at its last meeting. There are, therefore, others who can speak to their quality, and if the tinctures cannot be instantly detected, whether diluted or undiluted, I claim that they be admitted as proofs of successful purification. Such tinctures are vended at from 10*d*. per pound upwards, and I find strong evidence of their practical purity in what is told me about the tincture of opium—viz. that the morbidly-sensitive stomach of the laudanum-taker does not detect any naphtha—a point which was a stumbling-block as affecting this tincture until lately.

As to the total consumption of methylated spirit, I have to thank the courteous Secretary of the Board of Inland Revenue for the following important information:—

"Somerset House, 18th July, 1862.

"Sir,—In reply to your further letter of the 15th inst., I have to acquaint you, that it is contrary to the practice of this department, and, indeed, would be manifestly impossible, to furnish private individuals with returns such as that you ask for.

"In this instance, however, I have departed from the usual custom, and annex a return of the quantity of spirits methylated in the four years ended 31st March, 1862.

"I am, Sir, your obedient Servant,

"*Mr. Richard Reynolds.*" "THOS. DOBSON, Sec.

Year ended 31st March.	Gallons.
1859	271,614
1860	347,355
1861	463,014
1862	492,295

Of course, no distinction is here made between its uses for the legitimate purposes originally contemplated, and those applications to Pharmacy which have since sprung up. But the fact that its consumption has nearly doubled in three years, is at least consistent with the idea that much finds its way into the chemist's shop. But the magnitude of this portion of the consumption is no matter of suspicion.

I have what appears to be reliable evidence of one firm of wholesale druggists using 250 gallons per week, which would be equal to 13,000 gallons per annum, and pay £11,000 duty to Government, were it pure spirit.

To those who ask why the Excise do not check the abstraction of revenue involved by the whole system, you have already replied in your leading article. When the purification was first practised, it is probable that the Excise were correct in regarding it as a smaller evil TO THEM than the illicit distillation which it had displaced.

Now, however, it is likely that the loss to Government is far greater than would have been involved by undetected distillation.

It is fortunate for our trade, in the presence of such an abuse, that we have, in the Council of the Pharmaceutical Society, a representative body; and I trust that we shall soon hear of active steps having been taken.

There will be many difficulties before the question is settled, and it certainly will be the duty of those who act for the trade to see that this be not loosely or inefficiently done. To some of our brethren, who think that their own town or district has escaped the plague, I would say, "Be not over-confident." Neither historic names nor old reputations are all clear in this matter. The honour of the trade, as well as self-interest, alike warn us to remove this "source of scandal to the Pharmaceutical body."

I am, yours respectfully,

13, *Briggate, Leeds, July 19th*, 1862. RICHARD REYNOLDS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The question of using "cleaned" Methylated Spirit in Pharmacy was fairly opened in your last number; but I believe that it was only opened, and that it will require the strenuous exertions of the members of the Society, individually and collectively, to effect its settlement on any permanently satisfactory basis.

It is not my intention, neither is it in my power, to add much to the facts contained in Mr. Reynolds's letter; but perhaps you will allow me to make a few remarks confirmatory of what is stated in it. To many of our London brethren the information it conveyed would be new, and perhaps startling; and though the question is one which affects Provincial Pharmaceutists in the greatest degree, I am sure they will not the less endeavour to aid in putting a stop to practices in which the honour of the whole body is concerned.

The practice of "cleaning" Methylated Spirit is now carried on almost openly; its dishonesty is acknowledged; and inasmuch as it affects the whole of our members, more or less, it is surely the province of the Society, as a body, to endeavour to take such steps with regard to it as shall mitigate the grievance. The permission to use "Methylated Spirit of Wine," free of duty, is doubtless a great boon to those who employ it in large quantities for the manufacture of finer chemicals; but we had better have chemicals at higher prices than be subject to the annoyances consequent on the present state of things, and its detrimental effect on our commercial morality.

Probably the permissive clause in the regulations in the excise has not been followed by the effects originally contemplated: we know that for some of the purposes the spirit was thought likely to be especially applicable, it has been found wanting; but it is not with these we have to do; the opposite state of things, viz. that it is used for purposes for which it was never intended, is that which most nearly affects Pharmaceutists.

On the preparation of "Methylated" Tinctures there is little to be said. It is in direct violation of the order of the College of Physicians; but this is a consideration which affects only the conscience of the person dispensing them. The manufacturer makes them, and so long as they are sent out distinctly as "methylated," it is a question of buying and selling; but the question now discussed is a much more serious one, the practices alluded to not admitting of an explanation consistent with common honesty.

I can confirm the truth of the statements relative to the use of Ammonia as the means of fraud. Within the last few days, however, I have been informed that this "dodge" has been put a stop to, and that the enterprising spirit of the manufacturer has found vent in a new one, which for a time may baffle the authorities. A go-ahead firm, not unknown in the north, now send out a "Spt. Æther. Nit. Dilut.," in reality "cleaned" spirit, with just a dash of Spirits of Nitre mixed with it; this, the buyer exposes for a short time to

the air, the smell goes off, leaving practically pure spirit, so cheap, that the discerning tradesman who prefers to prepare his own tinctures can have the satisfaction of doing so without their costing him more than a shilling or fifteen-pence per pound, and scarcely differing from those properly made.

It is obvious that the present mode of contaminating "Spirit of Wine" is totally inefficient, and some fresh method must be sought which will yield a compound that cannot, by any chemical process, be made available for those purposes for which pure spirit is essential.

I fear, Sir, that I have occupied too much of your space, but the importance of the subject is my best apology.

I am, yours respectfully,
HENRY B. BRADY.

40, *Mosley Street, Newcastle-on-Tyne, July*, 1862.

TO THE EDITOR OF THE 'PHARMACEUTICAL JOURNAL.'

Sir,—As Mr. Reynolds, in the last Journal, seems to ask for corroborative evidence of his statements, I can assert that I know of three instances where tinctures, and spirit of nitre, have been supplied to medical men, made with methylated spirit, when the genuine article was expected and paid for. And in Birmingham, I know that spirit of nitre made from methylated spirit is retailed at a low price, and, to make matters worse, is undistinguishable from the genuine. The one costing ten pence per lb., and the other three shillings, the fair dealer would have little chance where competition is great and the cutting system prevails. The excise regulations are somewhat inconsistent as regards the sale of methylated articles. For photographic purposes, methylated ether and alcohol have been largely used, and answered very well; the ether may still be obtained, but my London house (Messrs. Hodgkinson and Co.,) inform me that "recent excise regulations prohibit the sale of methylated alcohol." I do not think we have much to fear from *bonâ fide* methylated spirit or preparations made with it, could they be labelled so as fairly to represent their origin, but when such spirit is cleaned and sold for pharmaceutical purposes, the revenue must suffer considerably, as well as the honourable druggist.

I am, Sir, yours respectfully,
W. SMEETON.

Iron Bridge, July 18th, 1862.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

On a New Principle from the Acacia.—MM. Zwenger and Dronke have obtained from the blossoms of the Acacia a crystalline body, to which they apply the name of *Robinin*. This principle has the constitution of a glucoside, and, as will be seen presently, exhibits a remarkable relationship with Quercitrin.

Robinin is obtained by treating an aqueous extract of the acacia blossoms with alcohol, and concentrating the alcoholic solution until crystals are deposited; these are pressed, dissolved in boiling water, and neutral acetate of lead added; the liquid is filtered and treated with sulphuretted hydrogen to remove excess of lead, and the Robinin crystallized from the filtrate. It separates in the form of yellowish crystals, and is purified by repeated re-crystallizations from water.

Robinin is a neutral body, very soluble in hot water, slightly soluble in alcohol, and insoluble in ether. It is soluble in alkalies, producing a fine golden yellow-coloured solution. It easily reduces an alkaline solution of oxide of copper and also chloride of gold.

When Robinin is boiled with dilute hydrochloric acid, a decomposition occurs, sugar is formed in the solution, and a substance separates out which is identical in composition and properties with *Quercetin*,—the body which is produced when *Quercitrin* is treated in the same manner. A remarkable connection is thus established between these two principles, Robinin and Quercitrin; both of them yield Quercetin by decomposition. The saccharine substances which are simultaneously produced differ, however, in several important respects. The sugar from Quercitrin forms yellowish crystals with a sweet taste; reduces an alkaline solution of sulphate of copper even in the cold; and when mixed with yeast, undergoes vinous fermentation; by oxidation with nitric acid it yields only oxalic acid. Robinin sugar, on the contrary, does not crystallize, and when oxidized with nitric acid, yields principally picric acid. It does, however, reduce oxide of copper even in the cold, and is capable of undergoing vinous fermentation. Robinin dried at 212° F. has the formula $C_{50}H_{30}O_{32}$; dried at ordinary temperatures its formula is $C_{50}H_{41}O_{43}$, containing 11 atoms of water. Quercitrin has the composition $C_{38}H_{18}O_{20}$.

The decomposition of Robinin may be thus represented:—

$$\underbrace{C_{50}H_{30}O_{32}}_{\text{Robinin.}} + 4HO = \underbrace{C_{26}H_{10}O_{12}}_{\text{Quercetin.}} + 2(\underbrace{C_{12}H_{12}O_{12}}_{\text{Sugar.}})$$

and that of Quercitrin as follows:—

$$\underbrace{C_{38}H_{18}O_{20}}_{\text{Quercitrin.}} + 7HO = \underbrace{C_{26}H_{10}O_{12}}_{\text{Quercetin.}} + \underbrace{C_{12}H_{15}O_{15}}_{\text{Sugar.}}$$

Quercitrin appears to differ from Robinin in all other properties except this one of yielding Quercetin. It is difficultly soluble in hot water, and is precipitated by acetate of lead. It also possesses a different crystalline form.

On a New Alkaloid.—M. Rieth has extracted an alkaloid, to which he gives the name of *Aribine*, from the bark of the *Arariba rubra*,—a tree found in the forests of the Brazils, and, according to M. Martius, resembling the Cinchonas. The bark is characterized by the red colour of the interior portion, and is employed by the Indians for dyeing wool red.

The Aribine is extracted by digesting the bark in repeated quantities of water acidulated with sulphuric acid, concentrating the liquid, nearly neutralizing with carbonate of soda, and precipitating with acetate of lead, filtering, treating the filtrate with sulphuretted hydrogen, filtering, and precipitating the crude alkaloid from the filtrate with carbonate of soda. The precipitate is dissolved in ether, and the ethereal solution agitated with hydrochloric acid, which removes the alkaloid, the colouring matter remaining in the ether. Hydrochlorate of Aribine being insoluble in excess of strong hydrochloric acid, it is readily separated from the solution.

Aribine is colourless, and crystallizes both in the anhydrous and the hydrated condition. It possesses an alkaline reaction, and forms definite crystalline compounds. It has a very bitter taste, although it is but slightly soluble in water. It is remarkable for containing no oxygen. Its composition is $C_{46}H_{20}N_4$.

Separation of Silver from Copper.—M. Verlandt indicates the following means for effecting this result:—Dissolve the alloy in nitric acid, and evaporate to dryness to remove the excess of acid. To every 30 parts of salt so obtained add 150 parts of distilled water; let it dissolve and filter. To the solution add 420 parts of a solution of protosulphate of iron, made with 165 parts of sulphate and 255 of water. A precipitate is produced, which is collected and washed, first with dilute sulphuric acid, and then with water. It consists of the metallic silver in a state of purity.

To ascertain the Purity of Chloroform.—M. Heintz has stated that chloroform is not attacked by sodium or potassium, even at the boiling point. M. Hardy proposes to employ this fact as a means of ascertaining the purity of chloroform. If

a small piece of sodium is thrown into pure chloroform, no action whatever takes place; if, on the contrary, any impurity, such as alcohol, etc., be present, then a disengagement of gas takes place.

PRELIMINARY RESEARCHES ON THALLIUM.

BY WILLIAM CROOKES, F.C.S.

(*Abstract of a Paper read before the Royal Society, June* 19, 1862.)

The occurrence of a brilliant green line in some selenium residues, whilst examining them for tellurium, led me first to suspect the presence of a new metal. In March, 1861,* I announced definitely that the green-line substance was decidedly a new element. The paper alluded to contained a sufficient number of the reactions of this body to enable me to prove chemically, as well as optically, that I was dealing with an element possessing well-defined characters. Pursuing the investigation, I was enabled, in the following May,† to give a further account of this body, and to propose for it the name of *Thallium* (symbol, Tl). In the same note I gave the localities and description of several minerals in which I had found the element, and also a method of extracting it from them in a pure state. Considering that I had sufficiently announced the discovery in these papers, which were republished in nearly every chemical journal in Europe, I turned my attention towards procuring a source of thallium which would enable me to prepare this body on the large scale; my experiments having hitherto been confined to mineralogical specimens, which I had difficulty in tracing to their source, and the whole amount of thallium which I had as yet obtained not exceeding three grains in weight.

After some delay, Mr. Thornthwaite was good enough to supply me with a considerable quantity of crude sulphur distilled from Spanish copper pyrites. In this I found thallium present to the extent of one or two grains to the pound, and up to within the last few months, it has been from the element prepared from this source that I have been working. I have recently, however, succeeded in finding an ore containing thallium, which is worked in this country, and from which I hope to be able to prepare the metal in larger quantities.

I have found the following the most advantageous method for extracting the new element from sulphur or pyrites:—

Powder the ore very finely, and dissolve as completely as possible in strong hydrochloric acid, with gradual addition of nitric acid, until all solvent action ceases; then dilute with water and filter. Evaporate down, to drive off the excess of nitric acid, adding a little sulphuric acid if necessary, and taking care that the solution does not get dry, or even pasty. Then dilute with water and heat gently, to be certain of getting all the soluble portion dissolved. Filter; if lead be present, the greater portion will be left behind in this operation in the form of insoluble sulphate. Dilute the filtrate considerably, and add a solution of carbonate of soda until the reaction is distinctly alkaline; then add an excess of solution of cyanide of potassium (free from sulphide of potassium). Heat gently for some time and then filter. The precipitate contains the whole of the lead and bismuth which may be present, as carbonates, whilst the thallium is in solution. A current of sulphuretted hydrogen now being passed through the liquid precipitates all the thallium, whilst the copper, antimony, tin, and arsenic remain dissolved. If cadmium and mercury are present, they will accompany the thallium. The former can readily be dissolved out by warm dilute sulphuric acid, which has scarcely any solvent action on the sulphide of thallium; whilst this, in its turn, can be separated from the sulphide of mercury by being boiled in moderately dilute nitric acid, in which the sulphide of mercury is insoluble. These two metals are, however, seldom present with thallium in the ores which I have examined. The nitric acid solution is now to be evaporated to dryness, the residue dissolved in

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* 'Philosophical Magazine,' Fourth Series, vol. xxi. p. 301, and 'Chemical News,' vol. iii. p. 194, March 30, 1861.

† 'Chemical News,' vol. iii. p. 303, May 18, 1861.

hot dilute sulphuric acid, and a piece of pure metallic zinc placed in the liquid; th thallium will be at once precipitated in the form of a deep brown powder, which soon changes to a heavy, black, granular precipitate. The metal can be obtained in the coherent form by fusion in hydrogen.

This method of analysis is given on the supposition that all the above metals are present. It may generally be much abridged, as the ore is seldom of so complicated a character. If there is a difficulty in procuring perfectly pure zinc for the reduction of the sulphate to the metallic state, this can be effected by passing a weak voltaic current through the liquid, using platinum poles; the metal will then be precipitated in the reguline or spongy state, according to the strength of the current. I have not been very successful in reducing the oxide by hydrogen. The current of gas carries the volatile oxide away from the heated part of the tube before complete reduction takes place. It is, however, probable, from an observation made towards the conclusion of this experiment, that with a longer tube in proportion to the quantity of material, kept at a good heat throughout its length, this plan might give good results, the metal being considerably less volatile than the oxide.

In many cases, when minute traces only of thallium accompany large quantities of other metals, it may be advisable to repeat the whole or some of the above operations, in order to purify this element from foreign metals which may have escaped complete removal.

I now pass on to a description of thallium and its chemical reactions.

Thallium in the pure state is a heavy metal, bearing a remarkable resemblance to lead in its physical properties. Its specific gravity is, however, higher—about 12. The freshly-scraped surface has a brilliant metallic lustre, not quite so blue in colour as lead, and it tarnishes more rapidly than this latter metal. It is very soft, being readily cut with a knife and indented with the nail; it may also be hammered out and drawn into wire, but has not much tenacity in this form. It easily marks paper. The fusing point is below redness, and with care several pieces may be melted together and cast into one lump. There is, however, generally a loss in this operation, owing to its rapid oxidation. The metal itself does not appear to be sensibly volatile below a red heat. I have made no special attempts, at present, to determine the atomic weight, although, from two estimations of the amount of sulphur in the sulphide, it appears to be very heavy. The figures obtained did not, however, agree well enough to enable me to speak more definitely on this point, than that I believe it to be above 100. I may mention that I obtained this element in the pure metallic state, and exhibited it to several friends as early as January last,* and should then have published an account of it, had it not been for the reasons already mentioned. Thallium is soluble in nitric, hydrochloric, and sulphuric acids; the former attacking it with greatest energy, with evolution of red vapours.

Oxides of Thallium.—Thallium forms two, and probably three oxides: one possessing basic properties, which I shall call the oxide; another containing more oxygen, possessing acid properties, which may, therefore, be called thallic acid; and, most likely, a third, or sub-oxide, which forms the first portions of the precipitate given by zinc in solutions of this metal; the first action being a darkening of the solution, and the production of a deep brown powder, which, by longer contact with zinc, turns to a dense black precipitate.

Upon carefully evaporating the nitric acid solution upon a water bath, but not carrying it to dryness, a mass of deliquescent crystals is obtained on cooling, which are decomposed upon addition of water with separation of a white or pale yellow precipitate, which appears to be a subnitrate, and an acid solution containing nitrate of thallium. If the liquid is evaporated quite to dryness, and kept at a temperature of 100° C. for a little time, the nitric acid goes off, and leaves a residue of thallic acid.

Thallic Acid.—This acid is soluble in water, and may be obtained in the crystalline form from its aqueous solution. It then forms crystals, which are permanent in the air and have an acid reaction to test-paper. The thallates of the alkalies are also soluble in water, and may be prepared by dissolving the acid in the alkali, or by fusing thallium or its oxide with a mixture of alkaline carbonate and nitrate. The method

* See 'Chemical News,' vol. v. pp. 349, 350.

I originally published for extracting thallium was based upon the formation, in this manner, of an alkaline thallate soluble in water. This acid is also produced in solution when permanganate of potash is added to a soluble salt of oxide of thallium.

Chloride of Thallium.—If a current of dry chlorine is passed over precipitated thallium at a moderate heat, they combine with formation of a volatile chloride, which condenses in the cool part of the tube in the form of a pale yellow crystalline powder, fusing together in part to a crystalline lump. Water only partially dissolves this, with production of a white insoluble residue. Dilute hydrochloric acid added to the turbid solution immediately renders it clear. Upon evaporating this solution over a water bath, white crystals are deposited. When the nitric acid solution of thallium or its sulphide is evaporated with an excess of hydrochloric acid, and then more hydrochloric acid added, and the evaporation repeated to a syrup, a residue is obtained which is apparently decomposed by water with production of a white precipitate. This is chloride of thallium; it is insoluble, or nearly so, in water, but readily soluble in dilute hydrochloric or nitric acid.

Sulphide of Thallium.—When sulphuretted hydrogen is passed through the acid solution of chloride of thallium, a partial precipitation of a reddish-brown powder takes place. This appears to be a combination of the chloride and sulphide, and the metal is never entirely removed from solution by this means. The best method of obtaining the sulphide is to precipitate it with sulphide of ammonium in an alkaline solution. Unless a large quantity of thallium is present no immediate effect is produced beyond the darkening of the liquid; it assumes a brown tint, which becomes rapidly more and more intense, especially upon gently heating it, until the sulphide of thallium separates in the form of a deep brown heavy precipitate, which shows a great tendency to collect together in clots at the bottom of the vessel; this formation of the sulphide is very characteristic of the metal. Sulphide of thallium is insoluble in an excess of sulphide of ammonium, ammonia, or cyanide of potassium. Its complete precipitation as sulphide from solutions containing an excess of cyanide of potassium affords a ready means of separating thallium from several metals with which it is frequently associated. It is difficultly soluble in hydrochloric or sulphuric acid, but readily so in nitric acid. When dry, it is a deep brown, almost black, powder, fusing and volatilizing when heated. When pure, it is neither so fusible nor so volatile as sulphur; but when it occurs with an excess of this latter element, it is very difficult to separate from it by sublimation.

Carbonate of Thallium is precipitated upon adding an alkaline carbonate to the acid chloride solution. It is moderately soluble in an excess of carbonate of ammonia, and readily so in cyanide of potassium. This is a very definite reaction, and enables thallium to be separated with accuracy from lead and bismuth.

Sulphate of Thallium.—When the hydrochloric or nitric solution is evaporated down with sulphuric acid, the more volatile acid is driven off, and the sulphate is left behind. It is soluble in water.

Iodide of Thallium is precipitated as a yellowish-red powder upon cautious addition of iodide of potassium to a solution of thallium. It is readily soluble in excess of iodide of potassium, forming a colourless solution.

Phosphate of Thallium forms a white floeculent precipitate, soluble in mineral acids, but sparingly soluble in acetic acid.

Ferrocyanide of Thallium is white and insoluble in water.

Cyanide of Thallium is precipitated as a white or light brown powder upon the cautious addition of cyanide of potassium to a solution of thallium. It is readily soluble in an excess of the precipitant.

Chromate of Thallium is a pale yellow precipitate, soluble in acids, and precipitated upon neutralization with ammonia.

No precipitates are produced when a solution of thallium is mixed with *protochloride of tin*, *oxalic acid*, *carbazotic acid*, *sulphurous acid*, or *protosulphate of iron*.

Most of these reactions have been independently verified by my friends, E. O. Brown, Esq., and J. Spiller, Esq., of the Chemical Department, Woolwich Arsenal; and I am glad to be enabled to take this opportunity of expressing my obligations to them for their valuable aid. The reactions are sufficient to prove chemically that the body under examination is a new element. Its behaviour in the spectrum apparatus is

perhaps the most conclusive test upon this point. When a minute portion of the sulphide, chloride, or, in fact, any compound of thallium is introduced into the flame of the spectroscope, it immediately produces a single green line, perfectly sharp and well-defined upon a black ground, and of extraordinary purity and intensity, almost equal to the sodium line in brilliancy. It is not, however, very lasting. Owing to its great volatility, a portion introduced at once into the flame merely shows the line as a brilliant flash, remaining only a fraction of a second; but if it be introduced into the flame gradually, the line continues present for a much longer time. If also a piece of metallic thallium be introduced into the flame on a platinum wire loop, they fuse together, and the alloy gives the green line rather more permanently, although, of course, fainter.

Working on a small scale, it is not easy to obtain these compounds free from soda; but when that is effected, and a tolerable quantity of substance is held on a loop of platinum wire in a flame, the green colour is most brilliant, and produces very extraordinary effects upon the appearance of surrounding objects. If thallium could be obtained in quantity, this ready means of producing an intense and homogeneous green light could not fail to be applicable to some useful purpose.

The green line of the thallium spectrum appears to be unaccompanied by any line or band in other parts of the spectrum. A flame of sufficient temperature to bring the orange line of lithium into view produces no addition to the thallium line; and an application of telescopic power strong enough to separate the two sodium lines a considerable distance apart, still shows the thallium line single. I consider, therefore, that I am justified in stating that thallium produces *the simplest spectrum of any known element.* Theoretical inquiries into the cause of the spectrum lines and their relation to other constants of an element may be facilitated now we know a metal which gives rise to luminous vibrations of only one degree of refrangibility. The remarkable simplicity of the thallium spectrum offers a strong contrast to the complicated spectra given by mercury, bismuth, and lead, the metals to which it has the most chemical resemblance.

The position of the green line does not coincide with any definite line in the solar spectrum. According to Kirchhoff's theory, we must therefore assume that thallium is not present, at all events, to any great extent in the sun. Under the highest telescopic power of my apparatus, the line appears to be absolutely identical in refrangibility with a sharp, well-defined line in the barium spectrum, to which Professors Bunsen and Kirchhoff have given the name Ba. δ. Want of material has hitherto prevented me from taking accurate measurements of the distance between the thallium line and the principal lines of the solar spectrum.

This green line is an exquisitely delicate test for the presence of thallium, and shows it to be a somewhat widely distributed element. Many specimens of crude sulphur contain it, especially when rather dark-looking. In most cases it is only necessary to set fire to as large a piece of sulphur (less than a pea) as the platinum loop will hold, and when it has nearly burned away, to blow it out, and then introduce it at leisure into the flame of the spectroscope, for the thallium to show its presence by a bright green line, which will flash for an instant into the field of view. Although the greater part of the thallium is left behind after burning off the excess of sulphur in this manner, some of it volatilizes; and consequently, if the specimen gives no indications of thallium by this treatment, it will be advisable to dissolve out as much of the sulphur as possible with bisulphide of carbon, and then to test the residue in the flame.

Thallium is a constituent of very many mineral ores. Upon examining a large collection of cupriferous pyrites from different parts of the world, I found it present in more than one-eighth. It is not confined to any particular locality, neither does it seem to bear any relation to the presence or absence of arsenic in the mineral. I have, however, very rarely met with it in pyrites in which copper was absent. For most cases, it is only necessary to powder a small fragment of the mineral and ignite a little of it in the flame, on a moistened platinum wire, for the green line to be distinctly visible.

If a thalliferous pyrites is finely powdered and then heated to redness in a glass tube as much as possible out of contact with air, the sulphide of thallium, together with some free sulphur, sublimes from it, and may be condensed by appropriate arrangement. This sublimate gives the thallium line with great brilliancy.—*Chemical News.*

ON THE PETROLEUM SPRINGS OF WESTERN CANADA.

BY CHARLES ROBB, MINING ENGINEER, MONTREAL.

(*Read before the Canadian Institute, February 2nd,* 1861.)

The existence of vast reservoirs of mineral oil hidden beneath the rocks in the western part of our Province, and now for the first time being disclosed to the light of day, forms a subject of the deepest scientific interest, and will amply justify an inquiry into its nature and probable origin, on scientific grounds only. But when we consider the additional importance attaching to the question from the commercial value of the material; and since, in the present crisis of the history of Canada, so much study is directed to the development of her natural resources, no further considerations need be urged to secure attention to the subject.

Petroleum, mineral oil, or fluid bitumen, is an inflammable substance, composed of carbon and hydrogen; of a black or deep brown colour, unctuous to the touch, and exhaling a strong and unpleasant odour. It exudes from the earth, or flows into wells in the manner of water springs, and is generally accompanied with an evolution of gas,—the pressure of which seems to constitute the force which occasions the flow at the surface. Springs of petroleum and naphtha (an allied substance) occur in many parts of the world, and are not peculiar to any of the geological formations.

In the Island of Trinidad there is a great deposit of asphalt, forming a lake about three miles in circumference, and of unknown depth. The pitch at the sides is perfectly hard, but towards the middle it becomes softer, until at last it is seen boiling up in a liquid state, emitting a disagreeable odour, which is sensibly felt at ten miles distance. The appearance of ebullition, however, is probably due, not to heat, but to the evolution of gas; and the tar probably floats on water. In the Island of Barbadoes considerable quantities of petroleum are derived from tertiary strata; and in California, this substance has recently been discovered in great abundance. Lake Asphaltites, or the Dead Sea, in Judæa, derives its name from the fact of this material abounding around its shores; here the rocks are of secondary or limestone formation. The bitumen employed by the ancient Babylonians, instead of mortar, was chiefly derived from the fountains of Is—the modern Hit—on the river Euphrates. These fountains are considered to be an inexhaustible source of bitumen, which still flows copiously, mingled with intensely saline and sulphureous waters. The rocks of the district are argillaceous limestone, interspersed with beds of coarse gypsum; but the cause which has for several thousand years produced the perennial flow probably lies at a considerable depth below the surface.

Naphtha is found in Persia and Circassia, rising in the form of vapour through marly soils; and in the north of Italy and some parts of France, the substance is found in considerable abundance. But probably the most powerful and copious petroleum springs yet known are those situated on the banks of the Irawaddi, in the Birman Empire, where in one locality there are said to be no less than 520 wells, annually yielding 400,000 hogsheads of the fluid; and which are reported to have been worked for ages without any symptoms of failure. These springs issue from a pale blue clay, saturated with the oil, and resting upon a species of slate, under which is coal containing much iron pyrites. Mr. Oldham, Superintendent of the Geological Survey of India, pronounces the rocks which yield the petroleum of the Irawaddi to be tertiary, and of the eocene period.

The fact of the existence of the petroleum springs in our own neighbourhood is by no means a new discovery. The early French settlers, and the Indians of western Pennsylvania, were aware of their existence, and made use of their products. Old oil vats and oil wells have been discovered, affording undoubted evidence of human works of great antiquity; and in Enniskillen, the great centre of the oil spring region in Canada, deers' horns, and pieces of timber bearing the marks of the axe, have been dug up from considerable depths below the surface, in what appear to have been old wells.

The fact of such remarkable springs occurring in Western Canada could not fail to attract the attention of our provincial geologists, and accordingly we find them noticed in the reports of 1850–51 and 1851–52, although in a somewhat cursory manner,

leading to the inference that the material was only to be found in very limited amounts. In the first-named report we find the following slight notice: "Springs of petroleum, called usually *oil springs*, rise in the river Thames near its right bank in Mosa; the bituminous oil collected on cloths from the surface of which is used in the neighbourhood as a remedy for cuts and cutaneous diseases in horses. Similar springs exist in the township of Enniskillen, where a deposit of mineral pitch or mineral caoutchouc is said to extend over several acres on the seventeenth lot of the second concession." In a subsequent report, Mr. Murray, having visited the spot, thus describes the Enniskillen deposits: "This bed of bitumen, which in some parts has the consistence of mineral caoutchouc, occurs on the sixteenth lot of the second concession of Enniskillen, in the county of Lambton; but its extent does not appear to exceed half an acre, with a thickness of two feet over about twenty feet square, from which it gradually thins towards the edge in all directions. Bituminous oil was observed to rise to the surface of the water in Black Creek, a branch of Bear Creek, in two places on the seventeenth lot of the third concession of Enniskillen; and I was informed that it had been observed at other places further down the stream."

The foregoing accounts embody the sum of what was publicly known regarding the oil springs in Western Canada previous to the year 1853, at which date they began to attract the attention of adventurers. It was not, however, until the year 1857 that the material was turned to profitable account. In consequence of the very successful introduction of the new coal oils, both for illuminating and lubricating purposes, under the patent of Mr. James Young, of Glasgow, certain gentlemen, foremost among whom was Mr. W. M. Williams of Hamilton, formed themselves into a company and acquired the lands in Enniskillen, on which the superficial deposits of asphalt occur, for the purpose of using it as a substitute for coal in the manufacture of such oils—it being ascertained to contain 80 per cent. of volatile matters. It was soon discovered, however, on penetrating below the asphalt, that the material could be obtained in large quantities in the fluid state, and consequently much nearer the condition required in the manufacture. Ultimately the whole adventure devolved upon Mr. Williams, to whom alone is due the merit of developing this branch of industry in Canada, as well as of pointing out the road to success in the same direction in the United States. The capital which Mr. Williams and his associates have invested in the works is over $42,000.

At first the distillation was carried on at the wells, but latterly the per centage of loss in refining being so small (about 30 or 35 per cent.), it was deemed expedient to remove the works to Hamilton, and convey the crude oil thither in barrels. The total quantity which has been raised by Mr. Williams is about 200,000 gallons. Mr. Williams has now five wells in more or less successful operation, yielding on an average from 600 to 800 gallons per day; but the amount which the wells are capable of yielding has never been thoroughly tested, as the difficulty attending the transportation from the wells to the railway station—a distance of about sixteen miles—has hitherto restricted the yield. At first the oil flowed into the wells unmixed with water, but latterly, although the supply is undiminished, large quantities of water are associated with it, insomuch as to render it necessary to use steam pumps to drain the wells.

The success which attended Mr. Williams's operations speedily induced other adventurers to enter upon the same field; and similar oil springs having been found to exist in Pennsylvania, our excitable and speculative neighbours rushed with characteristic eagerness into the business; and detachments from the main body soon invaded the more peaceful and primitive regions of Enniskillen—probing and torturing the earth in all directions, and polluting the air and the waters with the stench and scum of the oil. The success which has attended their operations has been in many instances very fair, and in one or two highly favourable; but in the great majority of cases the lottery has turned up blanks, though there is certainly no lack of gas to buoy up the spirits of the adventurers. Mr. Williams seems to have struck the main artery, and indeed the fact of the superficial deposits on his lands are a sure indication that here the petroleum existed in the greatest abundance, and nearest to the surface.

The material penetrated is a very stiff light-coloured clay—in some cases almost pure white—no doubt chiefly derived from the ruins of decomposed rocks similar to those underlying the clay; unequivocal evidence of which is found in the fact that the

clay contains numerous fossils identical with those embedded in the roeks, which are found at various depths, alternating with beds of clay, and consist of thin strata, more or less of a shaley nature, plentifully eharged with the fossils peculiar to what is called the Hamilton group of the Devonian system of rocks. No rock of a bituminous nature seems as yet to have been struck; although detached masses of bituminous shale, identical with that whieh crops out at Kettle Point, on Lake Huron, and eontaining about fourteen per cent. of volatile matter, are frequently met with in forming the wells.

The depths hitherto penetrated vary from 40 to 120 feet; and in this respect little advantage seems to be obtained by eommencing operations on the low grounds as along the flats of the creeks; for at Mr. Williams's wells the depth is only about 40 feet, while at others in the immediate vieinity, on the flats of Black Creek, where the ground is at least 40 feet lower, although the depth penetrated is three times as great, the supply obtained is as yet inconsiderable. The strength of the oil, also, as indicated by the hydrometer, varies to a considerable extent in different wells, even although they may be very near together; and the supply to each well, at least in the southern part of the township, seems to be independent; these faets indieating the deep-seated origin of the oils. Here also the oil seems to be diffused throughout the clay, penetrating through numerous vertieal cracks or fissures both in the rocks and clay, evidently in obedience to some foree from beneath; no doubt due to the pressure of gas, which invariably issues in great quantities with the oil, giving to the wells the appearance of boiling ealdrons of pitch. These gases produee a remarkable effeet on the men who work in the wells, greatly resembling that caused by the inhalation of nitrous oxide or laughing gas; and, in order to the continuance of their operations, it is necessary to elear away the gas from time to time by exploding it. It has recently been ascertained that the vapours of naphtha, aniline, and other hydroearbons produce physiological effects resembling those of ehloroform and other anæsthetic agents.

In other parts of the township, as at Kelly's wells, ten miles north of Mr. Williams's, the conditions and mode of oecurrenee of the oil are quite different. Here it oecurs in a bed of gravel and boulders, at a depth of about 47 feet from the surface, asso-eiated with such an amount of water as to render the wells exeeedingly difficult in working, although the quantity of oil here is evidently very great. Whether these variations in the physieal strueture of the region have any eonnexion with the origin of the deposits, it is, in the present state of our knowledge of the subject, impossible with any degree of confidenee to determine. Recently oil has been obtained by drilling into the rock, and in such eases it is said to be of a superior quality to that derived from the clay or superfieial deposits.

The advantage whieh we possess in Canada over our neighbours in Pennsylvania and Ohio is, that the oil-bearing roeks lie much nearer the surface. On the other hand, the most of the oils obtained south of Lake Erie are lighter, and bear a less per eentage of loss in manufacture; they are also much more easily deodorized, or rather have comparatively little unpleasant odour even in the crude state. But the ehief drawback to the commercial value of the Canadian oil is its thiek and tarry eonsistenee; eausing it to foam in an uncontrolable manner, in the ordinary retorts used for rectifying earth and eoal oils, and to yield too large a proportion of heavy products. In view of these eircumstanees, it will obviously be expedient to prepare the material for the market in Canada, and with apparatus expressly adapted for the purpose.

I have hitherto purposely eonfined myself to what may be ealled a popular account of the oil springs, detailing only such facts as might attract the attention of a cursory observer. I shall now direct attention to what I proposed as the primary objeet of this inquiry, namely, an attempt to discover the source, and aceount for the origin, of these extraordinary deposits. And here I must premise that whatever theory I might have to advanee is only to be reeeived as a guess at the truth. When so mueh uncertainty and difference of opinion still exist among seientifie men with regard to the origin of coal, notwithstanding the amount of ability and learning that have been brought to bear upon the subjeet, it would be unreasonable to expeet that this comparatively unexplored region of research should be opened up all at once.

The first step in our inquiry will naturally be to investigate and explain the geolo-

gical structure of the region where the oil springs are found, regarding which no uncertainty exists, and which, apart from the subject of the oils, is peculiarly interesting.

Sir William Logan has pointed out that, if we conceive a line passing from the head of Burlington Bay through London, Zone, Chatham and Amherstburgh—being in fact the centre line or backbone of the Western Peninsula—such line would form what is called, in geological parlance, the summit of a flat anticlinal arch; that is, the strata bend or dip slightly in an opposite direction on either side of it. In the present case the dip is so small as to be almost inappreciable by instruments; but it is nevertheless certain that the strata which occupy that part of our peninsula now under review pass under the coal measures of Pennsylvania on the one hand, and of Michigan on the other, at a depth varying from 1000 to 2000 feet; which thickness of course represents, or is the measure of the time, geologically speaking, which elapsed between the deposition of the newest of our rocks and the carboniferous era. Consequently it is quite evident that we must not seek for the origin of the petroleum deposits in the coal formation, properly so called.

The outcrops of the various members of the series of rocks immediately overlying the Appalachian and Michigan coal-fields form strips or belts which are rudely concentric with the coal basins themselves. The region now under notice is precisely the tangent point (as it were) where the corresponding strata under each coal-field meet and blend together, giving to the region occupied by the strata in question a form approaching that of the letter X. These rocks are called the Hamilton Shales, and constitute the lowest member of the Devonian or Old Red Sandstone system. Although in this locality of no great thickness—probably not exceeding 60 or 70 feet—the formation is most interesting in a geological point of view, as containing a well-marked and highly characteristic group of fossils, including the earliest known traces of terrestrial vegetation and of fishes. The formation consists of calcareous shales, with thin bands of denser limestone, and occasionally beds of sandy limestone, which are valuable for building purposes. The shaly portions crumble rapidly on exposure, and form a gray or ash-coloured clay; the fossil contents, however, remaining entire.

At Kettle Point, on Lake Huron, a locality comprised within the geographical boundaries of the Hamilton Group, there is exposed an interesting section of highly bituminous and argillaceous slates, which also occur in outlying patches throughout the oil-producing region, and have been ascertained to belong to the lowest measures of the Chemung Group, the next higher in the series.* It would appear at first sight most obvious and natural to attribute the origin and source of the petroleum to the subterranean distillation of these shales, which contain an amount of carbonaceous matter abundantly adequate for its production; but there is most unequivocal evidence to prove that the oil and gas come from a lower source, and are in all probability the cause rather than the result of the bituminous nature of the shales.†

It is a peculiar and unique feature in the Canadian rocks of Silurian and Devonian age, that beds impregnated with bitumen, and evolutions of gaseous and fluid hydrocarbons occur at various pointsfrom the base to the summit of the series, although nowhere to such an extent as in the region now under review; and the fact that these oils have been obtained from the Hudson River group of rocks, in which few or no vegetable remains occur, would lead to the inference that the oils and gases may be entirely of animal origin. The upper beds of the Corniferous limestone in Canada, and the entire mass of the Hamilton shales, are characterized by the extraordinary profusion of organic remains, for the most part animal, with which they are charged; and the evidences which they furnish of the mode of their deposition indicate conditions highly favourable to the conversion of the organic matter into substances of a bituminous nature.

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* A full account of this highly-interesting section of rocks will be found in the 'Geological Survey Reports of Progress' for 1847–48 and 1853.

† This circumstance affords a strong corroboration of the theory which has been recently propounded before the French Academy by M. Riviere, attributing the origin of bituminous schists and shales in general to impregnation of their argillaceous material with carburetted hydrogen. See 'Wells's Annual of Scientific Discovery' for 1860.

The process of bituminization consists of a species of fermentation or combustion, usually thought to be peculiar to vegetable matter, placed in such situations as not only to exclude the external air and secure the presence of moisture, but to prevent the escape of the volatile principles. The ultimate elements, and even to a great extent, the proximate structure of animal and vegetable tissues, are identical; and it is susceptible of demonstration that animal muscle, placed in similar circumstances, may be converted into substances closely resembling the products of vegetable bituminization.

The epoch of the deposition of the rocks in question seems to have been a time when land and water were struggling for the predominance. The vast masses of the Silurian system of rocks had all been deposited in deep water; and the Devonian rocks are just beginning to emerge, forming vast lagoons, floored and surrounded by coral reefs, and densely inhabited by crinoids, brachipods, and trilobites; though the latter remarkable creatures, so largely developed a little lower down in the scale, are now becoming rare and approaching extinction. Calamites, the earliest known of terrestrial vegetables, appear struggling for existence among the waves and shifting sands; and the first created fishes sport in the shallow waters. The floor of the ocean, together with these low spits and reefs, is sinking by slow and intermittent stages, and the remains of the scanty vegetation are entombed with those of the marine animals. Layer after layer is thus formed, the crust of the earth still subsiding as each is deposited.

Let us now inquire what would be the probable result of this condition of things, in so far as it affects the present question. The organic matter thus profusely scattered along the shores, and subjected to the influences of air and moisture, would decompose in the ordinary manner; but when, after partial putrefaction, it was covered up by a layer of sand or calcareous mud, and thus removed from the atmospheric influences, the resulting gases would be confined as in a closed retort; and the carbon and hydrogen, being greatly in excess of the oxygen would enter into such combinations as we find subsisting in the petroleum and the various hydrocarbon gases; and these would remain pent up in crevices or caverns in the rocks until liberated either by natural or artificial means. In some cases, circumstances might be favourable for the production of the gaseous products unaccompanied by the fluid; and it by no means follows, as many imagine, that the development of gas, even in great abundance, would be an indication of the existence of oil in the same reservoir. The remarkable circumstance of the almost invariable association of salt water with petroleum would appear to afford a corroboration of this theory; for whether it be true, as some suppose, that the chloride of sodium exerts some chemical action on the bituminous matter favouring its production, it is at all events certain that the relative dispositions of land and water, which I have attempted to describe, would be highly favourable to the production of sea-salt.

Whether this theory be correct in all its details or not, it seems certain, judging from the similarity of the products in both cases, that the petroleum has been generated by a process analogous to that which takes place in the destructive distillation of wood-coal or peat in close vessels, where, owing to the limited or total absence of oxygen, the combination of hydrogen and carbon in the form of hydrocarbons is effected. Nature appears to have the power of performing, by means of long time and very moderate temperature processes which the chemist and manufacturer perform rapidly and by the application of great heat.

As bearing directly upon the chemical composition and nature of petroleum and its products, and illustrating the difference between the Canadian and Pennsylvania crude oils, and those derived from the Collingwood shales, I shall conclude by inserting (by the kind permission of the writer) the following letter with which I have been favoured by Professor Croft:—

"University College, Toronto, Nov. 22nd, 1860.

"Dear Sir,—In reply to your letter of the 20th instant., requesting information as to the chemical nature of the Enniskillen, Pennsylvania, and Collingwood oils, I am sorry that I cannot supply you with any very accurate details, not having examined these oils with a view to ascertaining their chemical composition, to any very great extent.

"The first two being natural products are of course quite different from the Colling-

wood shale oil, which does not apparently exist in a free state in the shale, but is obtained by and formed during the destructive distillation of the animal and vegetable substances contained therein. From the rock consisting almost entirely of fossil trilobites, the oil might perhaps be said to be of an animal origin, unless the rocks were subsequently impregnated with vegetable products.

"Hence the Collingwood oil will be found to assimilate in its characters to the oil obtained by the slow distillation of coal, and more especially to that from the Boghead Coal; and will undoubtedly be found to contain a number of those curious chemical compounds which have been so ably investigated by Greville Williams, in his researches on the 'Products of the Distillation of Boghead Coal.' These substances are of a basic character and rank with the volatile vegetable alkaloids, having the general formula, C_nH_mN.

"The petroleums, or rock oils, are essentially different, having been produced by a slow process continued through countless ages; and thus substances of a different chemical nature have been produced, although, perhaps, the material acted on has been nearly, if not quite, the same.

"I am not aware of any means by which we can distinguish the products generated in the great laboratory of nature from animal substances, from those produced from bodies of a vegetable origin. Reasoning from analogy I should imagine it to be impossible, for recent researches have shown great similarity, in many cases identity, between the artificial products from animal and vegetable substances. See Anderson, 'On the basis from Dippel's Oil;' Williams, quoted above, etc. etc.

"Besides the basic bodies above alluded to, these coal oils generally contain a number of hydrocarbons belonging to various series, *e.g.* Benzole, $C_{12}H_6$, and its homologues, Toluole, $C_{14}H_8$, Xylola; Cumole; etc.; and solid hydrocarbons, such as Naphthaline, $C_{20}H_8$; Paraffine, etc. etc.

"The petroleums seem to be composed of hydrocarbons of a different class, having the formula C_nH_n, such as $C_{12}H_{12}$—$C_{14}H_{14}$—$C_{16}H_{16}$, etc. etc., which are quite indifferent bodies, unacted on by nitric acid. Another substance exists in them which has been called Petrole, $C_{16}H_{10}$, and is acted on by nitric acid, and causes the brown or black colour when the petroleum is treated with nitric acid (and probably sulphuric?). It has been said that Benzole exists in the light oils, but I know not on what authority.

"When the Enniskillen oil is distilled it requires a high temperature to drive over much oil, and this oil, when re-distilled, does not pass over readily till between 200° and 210° Centigrade; the product, again distilled, goes over at 190° to 200°; and by repeated fractional distillations, I have no doubt from the above experiments, we might obtain an oil boiling at a somewhat lower temperature.

"When the Pennsylvania oil is distilled, it begins to pass over at about 130°, and a large proportion is distilled below 190°. When this product is re-distilled, a large proportion passes over below 150°.

"Hence the Pennsylvania oil contains a much larger proportion of light volatile oils than the Enniskillen oil. None of them, however, are probably of the formula $C_{12}H_{12}$, which boils at 70°; probably they belong to the higher part of the C_nH_n series; but in both cases (E. and P. oil) they are pure hydrocarbons, containing no oxygen, at least not in such a form as to act on potassium and sodium. The metals remain quite unaltered and with metallic lustre. Possibly there may be hydrocarbons of the formula $C_{n5}H_{n4}$ present.

"I am not aware that I have any further information to give you at present. The peculiar greenish colour is owing to fluorescence; if the Enniskillen oil be distilled very far, and the thick residue dissolved in hot alcohol, the solution is most powerfully fluorescent, but the dissolved substance is deposited as the solution cools. I am not aware that this fact has been observed. The Collingwood oil contains a very large percentage of heavy oil, paraffine, etc.; the light oil boils at 150° to 190°.

"Yours truly,

"Charles Robb, Esq., C.E. "Henry Croft."

ROCK OIL, ITS GEOLOGICAL RELATIONS AND DISTRIBUTION.

BY PROFESSOR E. B. ANDREWS, MARIETTA COLLEGE, OHIO.

My investigations have been directed chiefly to the oil of the coal rocks, and I propose in this paper to give some of my results.

The surface indications of petroleum are oil and gas springs. These springs are found scattered over a very large area.

It is doubtless well known to scientific men that there are, in the West, two distinct geological formations from which petroleum or rock oil is obtained. These are the bituminous coal measures and the Portage and Chemung groups (the Waverley sandstone of the Ohio Reports). The Portage and Chemung rocks sweep round in the form of a quadrant from north-western Pennsylvania into southern Ohio and south into Kentucky. Upon these rocks the famous oil regions of Pennsylvania and north-eastern Ohio are located. The oil regions of western Virginia and southern Ohio, including a portion of western Pennsylvania, lie in the coal measures. Marietta, Ohio, may be regarded as near the centre of these extensive oil-fields.

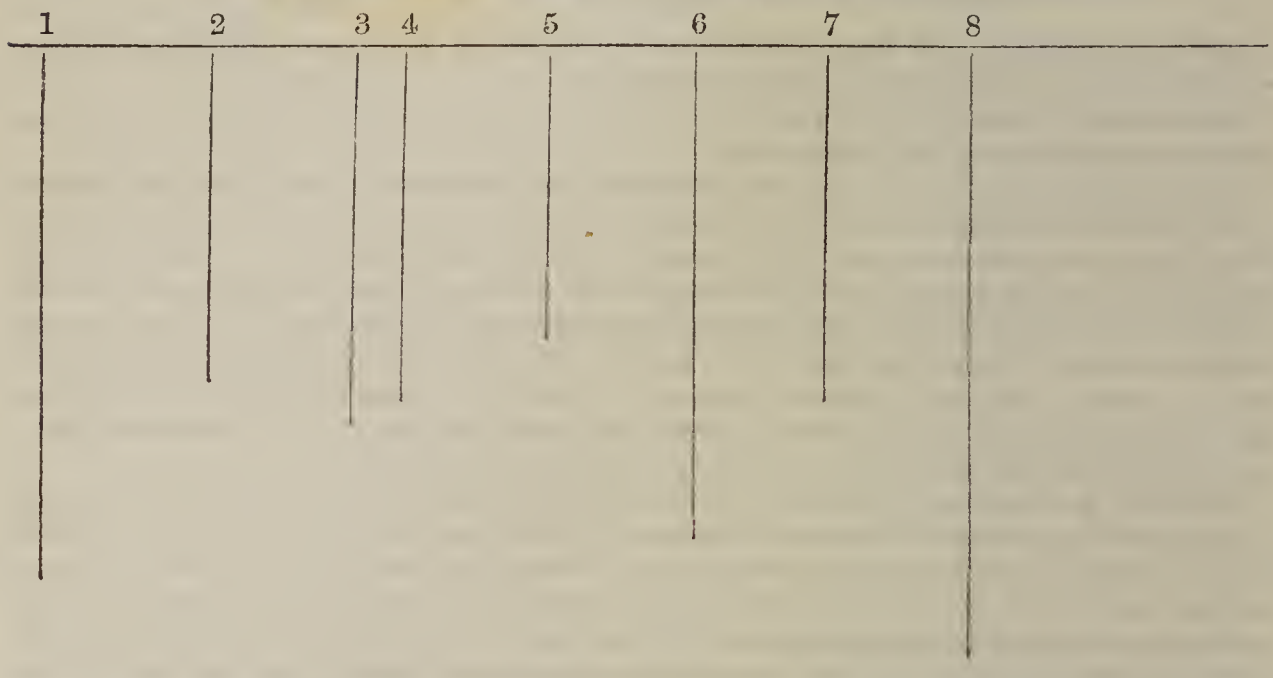
It is well known that in the manufacture of coal-oil a large amount of vapour or gas remains uncondensed. The town of Newark, Ohio, has been lighted for several years by the surplus gas from the oil works there. While it is believed that the oil cannot be produced in the subterranean distillation without the production of gas, it is also reasonable to suppose that at the very low temperature at which this distillation must take place, the formation of gas necessarily implies the formation of more or less oil. Hence in our bituminous coal measures a gas spring doubtless indicates the existence of oil in the rocks below. The great majority of these gas springs are unknown, since they are seldom discovered, except when they appear in streams; and probably the same may be true of oil springs, since the soil would absorb the oil and in only a few cases would it be detected. I have assumed that the oil is the product of the distillation of bituminous strata, at low temperatures. This theory, which is a modification of the old one of distillation (at high temperatures), has recently been brought forward by Professor J. S. Newberry, and has received the sanction of many of our most eminent chemists. The chief objection to it is the fact that the coal, cannel and bituminous, in our oil regions gives no evidence of having lost any of its full and normal quantity of bitumen or hydrocarbons. For example, at Petroleum, Ritchie Co., Va., where strata have been brought up by an uplift from several hundred feet below, seams of cannel and bituminous coal appear, which, if judged by the standard of Nova Scotia or English coals, have lost none of their bituminous properties. The cannel coal, although somewhat earthy, yields from forty to sixty gallons of oil to the ton.

The other theory, that the oil was produced at the time of the original bituminization of the vegetable or animal matter, has many difficulties in its way. If the oil were formed with the bitumen of the coal, we should expect that wherever there is bituminous coal there would be corresponding quantities of oil. This is not so in fact, for, as will be seen presently, there is no oil except in fissures in the rocks overlying the bituminous strata, and these fissures can be shown to have been made since the coal strata became bituminized. Again, upon this theory it will be difficult to explain the large quantities of inflammable gas always accompanying the oil. If it is generated exclusively from the oil, then we should expect to find the quantity of oil least where the gas springs have for ages been the most active, but at such places the oil, instead of being wasted, is the most abundant.

That the oil is accumulated in fissures in the rocks and that these fissures are more or less vertical, there is abundant proof. The oil in the same neighbourhood is found at very different depths. It is very seldom that two adjoining wells strike the oil at the same distance below the surface. The following diagram shows the relative depths of oil-wells on Burning Spring Run in Wirt Co., Va. It is evident that in this case the oil is not contained in anything like a horizontal reservoir. The famous Lewellyn well, marked No. 2, struck an oil fissure at one hundred feet, while the Athens company's well, marked 8, struck a large vein at two hundred feet. The oil in the first is said to stand at 41° (Beaumé), while that of the latter stands at 33°. On

Duck Creek, Washington Co., Ohio, wells very near each other show a difference of ten degrees (Beaumé) in specific gravity.

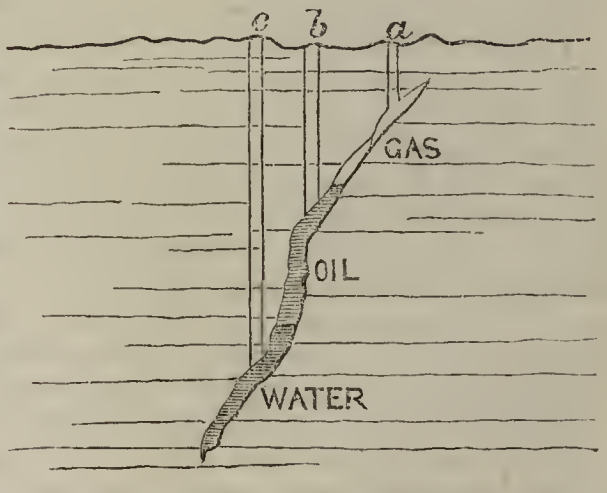
Fig. 1, showing the relative depths of the large wells in Burning Spring Run.



At Smith's Ferry, in Western Pennsylvania, on the Ohio River, much of the oil is of a light straw-colour, while it is said other wells yield an oil of the more usual dark-greenish colour. On the same lease of land and within six or eight rods of the well marked 8 in the previous figure, is a well two hundred and fifty feet deep. The oil from this well is not only different in its specific gravity from that in the other, but the deepest well contains fresh water, while the other contains salt water. From these and similar facts, it is evident that the oil is in distinct and separate fissures, and that these are vertical rather than horizontal.

The contents of these fissures are generally water, at the bottom, oil floating upon the water, and gas filling the space above the oil. Where the gas finds an outlet through a crevice in the overlying rocks, there is produced a gas spring. When the water finds an outlet, it carries the oil with it, and an oil spring is the result. I have found oil springs high up on hillsides.

Fig. 2.



An oil fissure may be struck at any point. The following figure will illustrate this. The letter *a* (fig. 2) shows the position of a well which strikes near the top of a fissure and in that part which is filled with gas. The gas rushes up, but no oil. If again the well is bored at *b*, it will strike oil, and the gas pent up in the upper part of the fissure will force the oil up through the well *b*. There are several oil-wells on Little Kanawha in which the gas has forced up very large quantities of oil. The action of the gas however soon becomes fitful and intermittent. If again the well is bored at *c*, it will strike that part of the fissure which contains water. In such case oil can be obtained only by pumping out the water. Doubtless many good oil-wells are thought to be worthless, and abandoned because they contain at first only water. If bored at the point *c*, in the water part of the fissure, water alone is to be expected until the pump has been used. There may be floating upon the water, higher up in the fissure, a large quantity of oil.

If the oil is found in fissures in the rocks, it is natural to suppose that in those

places where the fissures are the most numerous and largest, the oil would be formed in the largest quantity. This antecedent probability is fully verified by the facts. The rocks of Western Virginia and South-eastern Ohio may be divided into three classes, *those which are almost entirely horizontal, those which have a dip of from fifteen to forty feet in the mile, and those which are broken and dislocated by an uplift.* The strata from the Ohio River at Parkersburg up the Little Kanawha to within a few miles of the great oil wells are very nearly horizontal, and probably contain few fissures except such as have been produced by the drying and shrinking of the rocks. There is not, to my knowledge, a single productive oil-well in that region, although a large number of wells have been bored. The compact and unbroken clay shales and other strata rest upon the deep bituminous strata, and furnish no spaces through which the oil vapour could rise. Probably no such vapour is formed.

On the Great Kanawha River, at Pomeroy and vicinity on the Ohio River, in Athens, Morgan, Noble, Washington and other counties in Ohio, located on the coal measures, the rocks have more or less dip, and contain, as a probable result of the uplifting force, many fissures. These counties all furnish oil—Noble and Washington in considerable quantities. The salt wells on Great Kanawha, at Pomeroy on the Ohio, on the Hocking and Muskingum Rivers and on Duck Creek, revealed more or less oil.

But it is in regions where the strata have been the most disturbed and where the fissures are the most numerous, that the most oil is found.

Large quantities of petroleum have in former years been taken from the alluvial bank of Hughes River. The oil came up through a fissure in the underlying rock, and saturated a stratum of sand and gravel. This stratum was laid bare by removing the superincumbent earth and the oil worked out by hoes from the water and sand. This locality, next to the old Pennsylvania Oil Springs, has probably furnished more oil than any other locality in the country. A few wells have been bored in this region, but with what success I did not learn, nor had I time to investigate the question whether they were bored in that part of the geological disturbance, where the largest number of fissures would be found.

The oil fissures are struck at different depths, as has been already shown, consequently there is no such thing as an "oil rock," as many suppose. The oil is found in any kind of stratum. Each oil fissure doubtless extends vertically, or nearly so, through many different strata.

These wells have been unparalleled for the quantity of oil produced. Many of them, when first bored, poured out the oil in torrents, the oil being forced up by the pressure of gas. Hundreds of barrels were obtained from a well in a few hours. The Camden, Lewellyn, Weare and Harper well and doubtless others, are fine illustrations of this. They yield a marvellous quantity of oil. In many wells the oil is entirely free from water, and passes directly from the well into barrels for shipment. The oil varies in specific gravity from 32° to 52° (Beaumé).

The oil is evidently the accumulation of long ages. The valleys of erosion which cross this line of uplift in almost every direction, and which have been produced by the drainage of the rains falling upon the surface, show that the uplift, and consequently the fissures underneath, have existed for a vast period of time. It is therefore probable that during this long period the work of accumulation has been going on. If this is true, it will follow that when a fissure is once exhausted of oil, it may well be abandoned, as it will take a geological period to refill it. The original indications of oil in this region were, as I learn, only the gas springs, of which there were two on Burning Spring Run. Both of them are now destroyed by wells that have taken away the gas. A salt well bored at the mouth of Burning Spring Run, many years ago, yielded a large quantity of oil; and it was this salt well which caused attention to be directed to this locality, now so famous.

I have thus shown some of the geological relations of the oil here in the upper part of the coal measures. The *horizontal* strata in Wood and Wirt counties, Va., are, I think, the highest in the series. Containing few fissures, the chances of finding oil in them is necessarily very small.

The *inclined* rocks with a dip of from fifteen to forty feet in a mile, contain more or less fissures and consequently yield more or less oil. It is in these inclined rocks that the productive wells on Duck Creek, O., at McConnelsville, Pomeroy, etc., are obtained.

In the *broken* rocks, as found along the central line of a great uplift, we met with the largest quantity of oil. It would appear to be a law, that the quantity of oil is in a direct ratio to the amount of fissures. By this law, the great wells on Little Kanawha are easily explained. With so much room for expansion, the hydrocarbons of the coal and bituminous strata underneath have risen in the form of vapour, and during long geological ages have been filling the fissures with oil.

Since writing the above, I have examined the Report of the Geological Survey of Kentucky, vol. iii., and find that the oil region which lies in Cumberland county and in several adjoining counties, is probably situated upon a line of peculiar disturbance. Mr. Owen states that "the prineipal axis of disturbance, already mentioned, which passes in a south-west course through Lincoln, Casey, Russell and Cumberland into Monroe county, probably crosses the Cumberland (river) at the Riffle, near the Turkey River Bend, where a dip of about 4° was observed at the head of the Riffle in a direction of 50° east, while a reversed dip, north 50° west, at about the same angle was noticed near the foot of the Riffle." A careful examination might show that the fissures containing oil in this region are to be found chiefly along the line of this disturbance.

Of a locality in Cumberland county, Mr. Owen thus writes :—"On Crocus Creek, the blue limestone dips 2° to the north-east; a short distance up Punchcon Camp, the slate dips at an angle of about 1° in a course south 20° west, while not far off, on the Creek, it dips with about the same angle in a course north 10° to 20° east. Hence it is evident that the dip is very irregular." On Crocus Creek and on other streams in that region large quantities of oil were found many years ago in boring for salt water. From all I can learn, without visiting the region, the oil is found chiefly in the blue limestone and below the black shale. The oil is light in its specific gravity, while oil from similar locations in the geological series, in Ohio, is very thick and tar-like.

The oil from the coal measures varies in specific gravity from perhaps 20° to 52° (B.). Oil from Pomeroy, O., standing at 51° B., burns freely, and with brilliant flame, without distillation.

The heavier oils, such as are not profitable for distillation, afford a very superior lubricating oil. Hence the demand for heavy as well as light oils will doubtless be very great.

NITRATE OF SODA FROM IQUIQUE, IN PERU.

Iquique is the centre of the trade in Peruvian nitrate of soda, to which, indeed, it owes its importance. About from six to fourteen leagues from the coast, and running parallel with it through the province, at an elevation of 3300 feet or thereabout, is the Pampa of Taramugal. This plain or pampa was a sea lake, and the greater part is covered with salt along the western border; and generally not extending eastwards more than 500 yards from the verge of the old lake is found the "caleche" or "terra salitrosa," rough nitrate. Between the pampa and the coasts exist other old sea lakes, on the borders of which "caleche" is also found; but these deposits are of secondary import. The "caleche" is generally found in insulated masses, irregular in shape and thickness, which adds greatly to the expense of working. It is sometimes found with only a few inches of sand over it, but more frequently covered with a hard stone, consisting of sand indurated with salt; this is called "costra," the thickness of which varies from one to ten feet, but averages three feet. The "caleche" varies in thickness from one to nine feet, but in general runs from three to four feet; below this exists a soft sand, containing an abundance of crystals of glauberite and small quantities of borates of lime and soda. The strata consist of

1. Loose sand, a few inches thick.
2. Hard sand, indurated with salt, from one to ten feet thick.
3. "Caleche," from one to nine feet thick.
4. Soft sand, or cora.

The "caleche" varies in quality from nearly pure salt to 50 and 60 per cent. of nitrate, generally containing the following substances :—

Earthy matter, Nitrate of Soda, Chloride of Sodium, Sulphate of Soda, Sulphate of Lime, and traces of Chloride of Magnesium, and Iodides and Bromides.

It is impossible to state the respective proportions, as they vary with every different sample. The method of extracting and refining nitrate of soda is as follows :—

When "caleche" is required, the barretero (miner) makes holes in the ground where he expects to find it. If successful, he fills up the holes with coarse gunpowder made on the spot (costing three-and-a-half dollars per quintal), regulating the charge in proportion to the thickness and hardness of the "costra" and the thickness of the "caleche;" the charge varies from one to eight quintals, and occasionally as much as fourteen quintals; when blasted the whole mass is turned over and mixed. He then proceeds to separate the "costra" and "cora" from the "caleche," throwing aside all the latter that he does not believe to contain more than ten or twelve per cent. of nitrate; it is then broken into smaller lumps, to be conveyed to the "paradas.". A refinery of nitrate is called an "officina," and is generally placed in the centre of the of the calecheros or nitrate grounds, and consists of one or more paradas; a parada is a pair of round iron boilers, each holding from 70 to 300 gallons; these are placed together, in rough stonework, with a fire-place between them. At the parada, the acendrador breaks the lumps into pieces about the size of a fist, rejects the inferior pieces, so as to bring the whole to about 25 to 35 per cent. of nitrate. It is now thrown into the boilers with a quantity of water; after boiling some two or three hours, the fondeador (boiler), continually stirring the mass, supposing that the caleche is by that time exhausted, throws out the ripio (refuse), adds more caleche and mother-water; and after boiling some two or three hours, a well saturated solution is obtained; it is then by hand baled into a deposit, from whence, as soon as the mud and salts are deposited, it is baled into shallow coolers, where it crystallizes. The mother-water is then drawn off and the nitrate thrown out to dry. The paradas are charged twice a day, and the daily product is from fifteen to twenty quintals of nitrate, containing about 3 per cent. of impurities, chiefly common salt. The average cost of a quintal of nitrate is :—

Barretero, breaking out	12½	cents.
Acendrador, assorting	6¼	,,
Fondeador, boiling	12½	,,
Powder for blasting	6¼	,,
Asses bringing the caleche to the parada	3	,,
20 lbs. coals at 1.50 dol. per quintal	30	,,
Wear and tear of parrada, reparations, and depreciations	29½	,,
	1.00 dol.	

This system of making nitrate is the same as was first adopted at the commencement of the trade, and unquestionably well adapted for that early period, having the advantage of being simple, easily understood and worked; yet it is still continued, and the whole system of labour arranged to it. It is almost impossible to conceive a system more rude and more wasteful; and although many exertions have been made during the past ten years without success to improve it, yet that want of success has been caused chiefly by the lack of skilled labour in the province; still there is no doubt that it will be superseded, in the course of a few years, by the more refined and complicated apparatus now being introduced. The theory of the process of refining nitrate is this :—"Caleche" consists of nitrate of soda, chloride of sodium (common salt), and earthy matter (the other substances present exist in such small quantities that they are overlooked), and as chloride of sodium is very little more soluble in boiling than in cold water, whilst nitrate of soda is comparatively insoluble in cold but very soluble in hot water, it is very evident that it is only required to add such quantities of "caleche" to boiling water to procure a strongly saturated solution; the earthy matter, being insoluble, is left with the excess of common salt in the boiler, or the deposit, before it is discharged into the coolers, where, as the liquid cools, it deposits the excess of nitrate of soda, the mother-liquor retaining nearly all the salts in solution. Reverting to the customary process of refining, two systems are now being tried, which use steam; in the one (Gamboni's patent) the "caleche" is placed in an inverted semi-cone, with a perforated cover and bottom; through the side a jet of steam is introduced, mother-water is thrown on the cover, and the refined nitrate falls through the bottom,

and is at once conveyed to the coolers; in the other, steam is introduced to boil the solution; but both promise the same advantages—economy in the make and a superior article.

No sketch of the nitrate trade would be complete without some reference to the abuses. In the first it is badly based. The merchant makes advances to the salitreros, or officineros (makers), of money and goods, on the promise of receiving in return the product of the officina. This advance frequently is used in paying off old debts, or in advances to the labourers. The merchant must still keep advancing barley for the troops, coals and provisions for the labourer, &c., or there will be no nitrate forthcoming. This system trenches heavily on the merchant's resources, and occasionally leads to losses. The officineros, as a body (with some exceptions), are a reckless set of men, wasteful in their expenditure, and careless of their promises. Their arrangements with their labourers are also bad, their principal ones, the barretero, acendrador, and fondeador, being paid according to the product of the parada; recriminations are ever recurring, and not unfrequently leading to a closing of the works. Another thing must also be noticed—the great amount of adulteration that has taken place within the three past years. Rarely a cargo leaves that is less worse than 5 per cent., some even 7 to 10, and some samples assayed have shown as much as 30 to 50 per cent. of foreign matter. The adulteration is effected in two ways; in one, white "caleche" is ground and mixed with the refined nitrate; this is called green nitrate; the other, the powdered "caleche" is mixed into the solution, and at once put into the coolers; this is dirty nitrate. This is in some measure protected by the present state of the trade. Merchants in England purchase from the importer, and get a deduction from him corresponding to the amount of foreign matter in the article; but as the general sales are made without any deduction, then the worst cargoes are the most profitable to the merchants.

The province has not been thoroughly surveyed; but enough "caleche" has been discovered to yield an increased supply for ages. In May, 1856, they were about 100 officinas at work, with about 250 paradas, but the work is not constant; 240 days is a good year's work. The principal sales of this article are made in Valparaiso on the usual terms, viz. ore well sacked, not to contain less than 95 per cent. of nitrate, placed in the ship's launch outside the surf. The price has been very fluctuating, commencing at 18 reals, rising to 20 reals, falling to 16 reals, and then in four months rising to 23 reals, but taking an average price of 19 reals; 936,719 quintals, with the exchange at 46 dollars, would give £426,402. 5*s*. 10¾*d*. The other salts found in the province are chloride of sodium, biborates of lime and soda, sulphates of lime and soda, magnesian alum, &c. Iodine exists with the nitrate, and throughout the calcheros traces of boracic acid have been found in the water.

METEORIC STONES.

Rammelsberg ('Chemisches Centralblatt,' No. 1, 1862, quoted from the *Bericht der Akad. der Wissenschaften zu Berlin*) has examined some aerolites and supposed meteoric stones from North America. An analysis of the celebrated aerolite of Bishopsville, South Carolina, yielded the following results:—Silica, 57·52; alumina, 2·72; sesquioxide of iron, 1·25; oxide of manganese, 0·20; Magnesia, 34·80; lime, 0·66; soda, 1·14; potash, 0·70; ignition loss, 0·80 = 99·79. This composition is considered to indicate a mixture of several substances, rather than a single definite compound. The supposed meteoric origin of the so-called aerolites of Waterloo, Seneca County, New York, of Richland in South Carolina, and Rutherford, North Carolina, is shown (as already surmised by others) to be entirely fallacious. The first is merely a ferruginous clay; the second, in all probability, a fragment of brick or tile; and the third, an impure cast iron, containing 15·7 per cent. of silica.

SILVERING GLASS AND OTHER SURFACES.*

This invention has for its object improvements in silvering glass, and other surfaces. For this purpose I employ a mixture of ammonia, nitrate of silver, with a solution of Rochelle salt (tartrate of potash and soda); this mixture is applied to the surface of glass to be silvered, and after a short time the silver is deposited on the glass as a bright film. The silver is deposited at the ordinary temperature of the air; thus it is not necessary to heat the surface, as when other mixtures are employed. The film of silver may be strengthened by depositing over it a cheaper metal, such as copper. The process above described is also applicable for silvering other surfaces; it is, for example, very useful for giving a metallic and conducting surface to articles on to which it is desired to deposit copper by electricity, and where the article itself is not a conductor of electricity.

In order to silver the surface of paper, or of a woven fabric, or other similar surface, I first deposit the silver on to a polished surface, such as glass; then attach the fabric thereto by suitable cement, and carefully strip the fabric, together with the silver, from the polished surface. In some cases, I obtain an ornamental effect by depositing the silver on a surface on which a pattern has been produced by dulling a portion of the surface.

And in order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe minutely the manner in which I prefer in practice to conduct the processes.

In order to silver a sheet of glass, I place the said sheet, previously washed clean with water, on a table, and rub the whole surface of the sheet with a rubber of cotton or other soft fabric wetted with distilled water, and afterwards with a weak solution of Rochelle salt in distilled water, about one part of salt in 200 parts of water. I then take a solution, previously prepared by adding nitrate of silver to ammonia of commerce; the nitrate of silver being very gradually added until a brown precipitate commences to be produced, and the solution is then filtered.

For each square yard of glass to be silvered, I take as much of the above solution as contains 20 grammes (about 309 grains) of nitrate of silver, and to this I add as much of a solution of Rochelle salt in distilled water as contains 14 grammes of salt, and the strength of this latter solution should be so adjusted to that of the silver solution that the total weight of the mixture of the two in the quantities above mentioned, may be 60 grammes. In a minute or two after the mixture is made it begins to become turbid, and it is then immediately to be poured over the surface of the glass, which has previously been placed on a perfectly horizontal table, but the plate is blocked up at one end, so as to give it an inclination of about one in forty; the liquid is poured on to the plate, along the higher edge, and it runs towards the lower; the pouring is done in such a manner as to distribute the liquid over the whole surface of the plate, without allowing any to escape at the edges. When this is effected, the plate is placed in a horizontal position, at a temperature of about 68° Fah. The silver will begin to appear in about two minutes. Before the end of ten minutes the plate will be covered, and in thirty minutes sufficient silver will be deposited; this is about two grammes of silver per square yard, which is enough for most purposes. The mixture is then poured off the plate, and the silver it contains is afterwards recovered. The silvered surface of the glass is then washed by pouring water over it four or five times, and the plate is set up to drain and dry. When dry, the silvered surface is varnished by pouring over it (in the same way as the mixture is poured on, as already described) a varnish, composed of the following materials, viz.:—Gum damar, 20 parts; Asphalte (bitumen of Judea), 5 parts; Gutta-percha, 5 parts; Benzine, 75 parts. This varnish dries and sets hard on the surface, and the glass is then ready for framing, or otherwise for use as may be required. When a surface of glass has been silvered as above described, a layer of copper may be deposited over the silver by the ordinary electrotype process or otherwise, as is well understood. I do not, however, prefer to do this when the object is to obtain a silvered glass, but in some cases I deposit a considerable

* Specification of the Patent granted to John Cimeg, of the County of Middlesex, England, for Improvements in Silvering Glass and other Surfaces.—Dated, March 13, 1861.

thickness of copper on to the silver, and then strip the copper and silver together from the glass, which will be done with facility when the coating of copper is thick. In this manner a sheet of any size of plated copper may be produced, plates of other non-absorbent materials (which will not act chemically on the silver solution) may be coated with silver in the same manner as plates of glass. When it is desired to give a metallic and conducting surface to an article which it is desired to electrotype, say, for example, a medallion of wax or gutta-percha, I silver it as already described, sufficient of the silvering mixture being employed to cover every part of the surface. In order to silver paper, woven fabrics, and other materials according to my invention, I, as already mentioned, strip the silver from the surface on which it is deposited by attaching to it the paper, woven fabric, or other similar material, and then removing the said material and the silver film together from the surface. The silver is first deposited, by preference, as already described, but it may be otherwise, on to a surface, by preference of glass, then on to the silvered surface is poured in the manner already set out, a varnish consisting of gum lac dissolved in wood spirit, one part of gum lac to from six to ten of wood spirit. When this varnish is dry and hard, a solution of one part of gelatine in from six to ten of water is also poured over, and allowed to set into a jelly; the paper, leather, or woven fabric, or other similar material to be silvered, is laid on and pressed in contact with the jelly, and it is then left to dry thoroughly; afterwards the material with the fabric is stripped from the surface, and the process is complete.—*From the Repertory of Patent Inventions, Jan.*, 1862.

ANTAGONISTIC EFFECTS OF OPIUM AND THE MYDRIATICS.

The following cases are given by Dr. Lee in the 'American Journal of Medical Sciences' and quoted in the 'Dublin Medical Press' of June 18th, belladonna being taken as the representative of the mydriatics.

An analogous case will be found in our number for May, page 583; and, as bearing upon the same subject, our readers will find an interesting paper by Dr. Nivison in the third volume (second series), page 277, "On the Antagonistic Effects of Opium and Quinine."

"The first, a child, aged six years, had been given, in mistake for syrup of rhubarb, a drachm of *succus belladonnæ*, an unofficinal preparation, very concentrated, and only used in collyria. The characteristic symptoms of belladonna poisoning were almost immediately apparent; the child's face became scarlet, and it tottered insensible to the floor. I was instantly sent for, and found the flush on the face deepening to a violet hue, the eyes fixed and staring, the pupils dilated to the utmost; tongue dry; pulse slow and bounding, and the child almost comatose. No stomach-pump was at hand, and I at once resolved to test the effect of opium. Twenty drops of laudanum by the mouth, and the same amount by the rectum, were simultaneously given, and at intervals of a half-hour the dose of twenty drops was repeated until the little patient had taken one hundred and twenty drops in all. After the third dose, the pupils began strongly to contract, the purple hue of the face to fade, and in three hours the child was well and running about the room.

"The second case alluded to was, on the contrary, one of opium poisoning, occurring in a child, aged two years. The quantity of laudanum taken could not be ascertained; for the mother, who had given the drug (as was supposed for the purpose of infanticide) obstinately refused to answer any question on the subject.

"Enough, however, had been swallowed to render a fatal prognosis almost positive. The skin was pale, cold, and clammy; pulse feeble, and beating only forty to the minute; respiration slow and laborious; pupils excessively contracted, and coma profound. A galvanic battery was sent for; but when obtained was so out of order as to be useless.

"Some tincture of belladonna, however, was at hand, and was instantly given in doses of fifteen minims, repeated at intervals of twenty minutes until four doses were taken. The first perceptible change was after the second dose, when the temperature of the skin rose several degrees; this was gradual, but was distinctly felt by the hand."

After the third dose, when spoken to, the child opened its eyes and showed signs of intelligence. About an hour after the fourth dose, the child was to all appearances well.

These cases present a double proof of the antagonistic properties, reciprocally, of these two agents. First, the promptness with which alarming symptoms of poisoning disappeared after commencing with the antidote. Second, the doses of the antidote were large enough to have proved poisonous, and would have done so had not the poison in the system antagonized the poisonous doses of the remedy. To a child six years old, forty drops of laudanum at once, and twenty drops every half-hour until one hundred and twenty drops are taken, would develop alarming symptoms, unless neutralized by some other agent.

If we rightly remember, the antagonistic powers of opium and belladonna were first made known by Dr. Joseph Anderson of Edinburgh. Since that, others have made the same observation, and practised accordingly.

With reference to the administration of opium in doubtful cases, the following observations are made :—

"For several years, the condition of the pupil of the eye has been our guide in doubtful cases. If the pupil is dilated, the opiate will be borne well, and will be productive of benefit. If the pupil is unnaturally contracted, we do not give opium, though other symptoms may seem to demand it. Under these circumstances, we give belladonna, and always with an improvement of symptoms. We think valuable indications may be derived from the observance of these opposite conditions of the pupil.

"Opium produces an influence upon the brain that results in a contraction of the pupil. If that influence already exists as a morbid or diseased condition, manifested by the symptom just referred to, then opium coincides with the morbid or diseased condition, and increases or intensifies it, and consequently the patient is made worse. As belladonna produces an opposite influence upon the brain, it is the appropriate remedy under such circumstances. Again, belladonna produces an influence upon the brain that manifests itself in a dilatation of the pupil. If a morbid or diseased condition exists, producing this same symptom, then the administration of belladonna will only increase it, and make the patient worse. Under such circumstances, opium is the remedy."

ON THE DETECTION OF STRYCHNIA AS A POISON, AND ON THE INFLUENCE OF MORPHIA IN DISGUISING THE USUAL COLOUR-TEST.

BY JOHN J. REESE, M.D., OF PHILADELPHIA.

The progressive increase in the number of deaths within the last few years, occasioned by strychnia, used either for homicidal or suicidal purposes, is a subject demanding the careful consideration both of the toxicologist and the medical jurist: and every circumstance connected with the detection of this most potent agent cannot fail to interest the medical profession at large.

The author lately had occasion to investigate the subject closely in connection with a case of alleged poisoning by strychnia. A man was indicted at the April term, 1860, for the murder of his wife, in Perry county, Pa. Although dying under suspicious circumstances, no *post-mortem* examination was made until six weeks had elapsed, when the body was exhumed. The stomach and a portion of the small intestine were carefully tied, and along with the adhering pancreas were conveyed to Philadelphia, and placed in possession of Dr. Reese for chemical examination. He found the organic structure but little changed in appearance (eight weeks after death), and the contents of the vessels consisted of four or five fluid ounces of a thick brownish homogeneous fluid.

Three separate analyses were made. The contents of the stomach—contents of the intestine—and the tissues themselves; each of which was carefully repeated; yet he "entirely failed to detect any evidence of the presence of strychnia, either by the bitter taste of thefinal extract, or by the very delicate *colour-test* employed."

Inasmuch as the *moral* circumstances of the case, and the symptoms, pointed to death by strychnia, the author naturally sought for an adequate cause to explain the failure to detect the poison. After giving due weight to the effects of elimination by the excretions during six hours that the patient survived, and to the agency of decomposing action during six weeks' inhumation, the author remarks on a circumstance in connection with the case which he viewed with especial interest, namely: "the fact that the woman had taken, just before death, by the advice of her medical attendant, *a quarter of a grain of morphia*, with a little ipecacuanha; but she did not vomit. Now the value of this fact is just this: It has been ascertained that the presence of morphia and other substances has the effect of disguising and entirely neutralizing the usual *colour-test* used for detecting strychnia; so that the latter might be undoubtedly present, yet if morphia were also present at the same time, the strychnia could not be discovered. It will be readily admitted that this is a point of the extremest importance to be settled by the chemist, in medico-legal researches. It is one to which no very especial attention has hitherto been given. It is merely mentioned as a casual fact in the various works on toxicology, but the only actual experiments recorded, to my knowledge, are those published by Dr. T. G. Wormley, in the 'Ohio Medical and Surgical Journal,' September, 1859, in which it is stated that when the morphia exceeds the strychnia in quantity, the possibility of discovering the latter by the colour-test diminishes." Dr. Reese accordingly undertook a series of experiments to satisfy himself in regard to this very important subject with the following results :—

"*Experiment* 1.—One-tenth of a grain of pure strychnia was added to about twelve ounces of water, into which were put several ounces of fresh beef, finely cut up, together with some starch, a little common salt, and a few drops of acetic acid; (the object being to represent, as closely as possible, the contents of a human stomach after a meal.) The whole was digested on a sand-bath for twelve hours at a moderate heat. It was then strained, pressed, and filtered; and afterwards evaporated down to a very small bulk. It was next divided into two separate portions, each of which of course would contain the 1-20th of a grain of strychnia. One of these portions was treated after the process known as Graham and Hoffman's (the alkaloid being removed by animal charcoal, and finally extracted by ether.) Here, a drop or two of the ethereal solution, representing about the 1-40,000th to the 1-50,000th of a grain, gave distinct evidence of strychnia by the usual colour-test. The second portion of the evaporated solution was divided into two parts, each of which would of course contain the 1-40th of a grain of the alkaloid. The first of these was treated according to the process of M. Staas, in which ether is used as the ultimate solvent: and the second part after the process of Mr. Prollius, in which the ultimate solvent was chloroform. In both instances I obtained the most satisfactory proofs of the presence of strychnia; operating upon a single drop of the fluids—which would represent, certainly, not over the 1,100,000th of a grain of strychnia.

"*Experiment* 2.—This was a repetition of the former experiment, except that the quantity of strychnia used was much smaller—only the 1-100th of a grain. After treating by Staas' process, and on concentrating the ultimate ethereal solution, the presence of strychnia was manifested both by the colour-test, and by the bitter taste of the extract. Here, the quantity of the poison operated upon was less than the 1-100,000th of a grain.

"*Experiment* 3.—This was an exact repetition of Experiment 2, except that to the 1-100th of a grain of strychnia, three times that quantity of morphia (1-33rd of a grain) was added. On treating this by Staas' process, as in the preceding cases, I could not discover the slightest trace of either strychnia or morphia, even after the ultimate ethereal solution was concentrated to a very small bulk by evaporation."

As the first two experiments were precise counterparts of those employed in the analysis of the stomach, the author feels justified in believing them to be delicate and reliable, and that the poison should have been isolated if present, unless its presence was masked. The *third*, he thinks, seems to prove most unequivocally that morphia, when present in excess along with strychnia, has this property of concealing the latter from the usual colour-test.

"*Experiment* 4.—This was also a repetition of Experiment 2, except that to the 1-100th grain of strychnia, the 1-50th grain of morphia was added instead of the 1-33rd

—or double instead of treble the quantity. Here, likewise, there was a total failure to discover the poison.

"*Experiment* 5.—This was a repetition of the last, except that only 1-100th grain of morphia was added to the 1-100th grain of strychnia, or an equal portion. The result here was that I obtained the faintest possible evidence of the presence of strychnia, and only after repeated trials."

From these last experiments I think we may conclude that *the influence of Morphia in preventing the detection of minute quantities of strychnia, in the presence of an organic fluid, depends upon the relative quantity of the two alkaloids;—the strychnia being not discoverable when the morphia is in excess, and barely discoverable when in equal quantity.*

Dr. Reese next instituted a set of experiments with a view of ascertaining the effect of morphia in disguising the presence of strychnia *in perfectly pure solutions*, free from organic mixtures, and the result pointed to the fact that the minuteness of the proportions detectable by the colour-test was inversely as the proportion of morphia was increased, as will be shown in the following tabular view :—

When the proportion of the two alkaloids was

One	strychnia	to	one	morphia,	he	was	able	to	detect	1-500,000th of a grain.
One	„	to	two	„	„	„	„	1-300,000	„	„
One	„	to	three	„	„	„	„	1-150,000	„	„
One	„	to	four	„	„	„	„	1-100,000	„	„
One	„	to	five	„	„	„	„	1-80,000	„	„
One	„	to	ten	„	„	„	„	1-10,000	„	„
One	„	to	twenty	„	„	„	„	1,5000	„	„

Beyond this the experiment was not pursued, Dr. Reese being satisfied that Wormley's observation, that the action of strychnia became more difficult as the proportion of morphia increased, was correct.

But an important point to be determined was, how a quantity of strychnia, almost infinitesimal, might be effected by an amount of morphia, which, though small in itself, yet bore a relatively large proportion to the strychnia ; just precisely such a state of things as would be likely to be met with in an analysis of the human stomach, and to decide this Dr. Reese tried the following experiments on three half-grown cats :—

"Half a grain of pure strychnia was given to the first animal, and in eleven minutes it died in a violent convulsion. The poison was very easily discovered in its stomach, by the usual tests, on the following day. To the second animal a quarter of a grain of strychnia and the same quantity of morphia were given ; and, somewhat to my surprise, the animal was deeply convulsed in six minutes, and died very quickly. Here the morphia, so far from counteracting the toxic influence of strychnia (as might have been inferred from its opposite physiological influence,) seemed actually to have increased its effects. The stomach of the second animal was likewise examined, but I obtained scarcely recognizable evidence of strychnia, owing doubtless to the influence of the presence of the associated morphia. It will be recollected that the quantity of morphia in this case was just equal to that of the strychnia. To the third animal, the 1-20th of a grain of strychnia, and the 1-10th of a grain of morphia (double the quantity) were administered. Convulsions tooks place in about fifteen minutes, and death in half an hour. The stomach was examined by Staas' process, as in the other cases, but with a total failure to detect the poison by the colour-test ; although the bitterness of the extract, and its decided action in producing tetanic convulsions in a number of frogs, clearly established its presence."

From all the foregoing experiments it appears to be conclusively established, that morphia does unquestionably possess the power, when present in excess, of completely disguising the colour-test of strychnia ; and this is emphatically the case when they are associated in organic mixtures, as in the contents of the stomach. Consequently this fact should always be taken into account in medico-legal investigations.

The moral evidence in the foregoing case was very strong, and although Dr. Reese's evidence entirely failed to establish the presence of strychnia, yet his evidence of the masking effect of morphia, taking in connection with the fact of the patient having taken morphia just before death, and the strong moral evidence, caused the convic-

tion of the accused, who subsequently made a full confession of the crime.—*American Journal of Pharmacy.*

In the same number of the 'American Journal of Pharmacy,' will be found a paper on the same subject by Dr. R. P. Thomas, who is of opinion that the discrepancies in the results of the published experiments of different observers depends in a great measure on their diverse modes of procedure.

The following is a description of the author's *Mode of Testing* :—

"In every instance the material to be tested was employed in the solid form, such as the pure alkaloids or their salts. If it existed in solution, it was reduced to a solid consistence by evaporation in a test capsule, spontaneously or by a very gentle heat. Having thus procured a solid substance, a small portion of it was placed upon a white plate, a drop of strong pure sulphuric acid was added, and trituration was carefully made with a glass rod until the substance was dissolved. Then a small quantity of powdered bichromate of potassa or of powdered ferricyanuret of potassium was deposited on the plate, *near the acid mixture, but not touching it,* and to the powder a minute drop of water was added,—just enough to partly dissolve it; and then, with a pointed glass rod, a little stream was drawn from each of the solutions in such a direction as to cross each other. Immediately at the point of intersection the play of test-colours was beautifully manifested. When the bichromate was employed, the sequence of colours was blue or violet, instantly changing to purple, then gradually becoming red, and finally greenish-yellow. When the ferricyanuret was used, the colour was a rich bluish-purple, changing rapidly to a light rose-red. It is important to proportion the sulphuric acid to the amount of alkaloid, avoiding an excess beyond what is necessary to its perfect solution; and therefore it is better to take the acid out of the bottle by a pointed glass rod, rather than to drop it from the lip."

The details of numerous experiments are then described, the first series of which was instituted for the purpose of determining how far pure morphia or one of its salts, when combined with strychnia, would prevent the manifestation of the colour-tests: the other series of experiments being made for the purpose of determining whether morphia in the presence of organic mixtures has the power of preventing the recognition of strychnia by the usual colour-tests. The agents employed in these experiments were, 1, Acetic acid, of specific grav. 1·041; 2, a solution of one drachm of caustic potassa in a fluid ounce of water; and 3, chloroform. Acetic acid was chosen, because when in excess it has the property of dissolving all the ordinary salts, both of morphia and strychnia, as well as their tannates; and the solution of caustic potash was selected for the purpose of dissolving morphia while it left the strychnia, which was in its turn taken up by the chroloform. The author concludes, from both series of experiments, that not only can strychnia be detected when in the presence of morphia or its salts, but that it can be regained from organic mixtures, notwithstanding the presence of three times its weight of sulphate of morphia.

The following practical suggestions are given :—

"1. In testing for minute portions of the poison, success or failure depends entirely upon the care given to the details of the process.

"2. In examining the contents of a stomach, the employment of heat is not required for the detection of strychnia, nor should any unnecessary fluid be added which might require subsequent evaporation. Equal measures of acetic acid and cold water, in sufficient amount to thoroughly acidulate the mass, are all that is requisite to extract any alkaloids or their salts that may be present, and, to ensure success, these must be reduced to the solid state.

"4. In the application of reagents for the production of the colour-tests, care should be observed not to add any more sulphuric acid to the strychnia than what is necessary to dissolve it; and, in like manner, the powdered bichromate of potassa, or ferricyanuret of potassium, should only be moistened, as by touching a glass rod with the point of the tongue and then rubbing it over the powder. In this manner, two saturated solutions or mixtures are obtained, which show the play of colours as soon as their margins are brought into contact, even though the quantity of alkaloid present be very minute.—*Amer. Journ. Med. Sci., April,* 1862."

ON KAVA OR AVA (*PIPER METHYSTICUM*).

BY G. CUZENT, PHARMACIEN IN THE FRENCH NAVY.

Formerly, the natives of Tahiti were only acquainted with one intoxicating drink, which they prepared by chewing the fresh root of the "Ava" (*Piper methysticum*), and immediately rinsing the disintegrated tissues impregnated with saliva, in water. But about the year 1796, the Europeans having taught them to ferment the fruits of the country, they acquired an immoderate passion for the new and boisterous drunkenness that these spirits produced. From that time, they submitted to fermentation the juice of oranges (*Anani*), the "pomme cythère" (*Visi*), the baked and macerated roots of the *Dracæna terminalis* (*Ti*), the juice of the pineapple (*Païnapo*), the fruits of the Pandanus (*Fara*), the bruised pulp of the fruit of the Fehii (*Musa Fehii* of Bertero), etc., etc.

In order to distinguish these new spirits from their original ava, which they named *Ava Madhi* (indigenous), or *Ava-Tahiti*, they call them *Ava Papœa* (foreign), applying to them likewise the names of the fruits from which they had been prepared: *Ava-Anani* (orange brandy), *Ava-Vihi*, *Ava-Ti*, *Ava-Painapo*, etc., etc.

The *Piper methysticum* of Forster, *Macropiper methysticum* of Miquel, belongs to the family of the *Piperaceæ*, indigenous to the isles of the Pacific; it is known at Tahiti under the names of *Ava*, *Ava-Ava*, *Evava;* at the Marquesas Islands it is called *Kava*, *Kava-Kava*. The Anglo-Tahitian dictionary designates it under the names of *Ava*, *Kawa*, *Kawa-Kawa*. The plant is cultivated in several islands for preparing the intoxicating drink of which we have spoken. Many varieties of it occur, of which some grow in dry soils, others on the banks of rivulets, or in very damp ground. The properties of the latter species are generally very feeble. The natives employ indifferently this or that Kava, and recognise the species by the mild form, the rapid action, or the lasting effects of the intoxication which it produces.

The *Piper methysticum* is a shrub, the root of which weighs, on an average, from 2 to 4 lbs., but which often attains larger dimensions, weighing 22 lbs. and more. It is entirely covered with a grey epidermis, white in the interior, sometimes of a citron yellow colour, as in the variety called *Marea*. The spirit prepared with this variety is yellower than that which is obtained from all the others. Occasionally it acquires a rosy tint, by exposure to the air, as in the variety of *Avini-Ute*. The root loses 55 per cent. of water on drying, becomes very light, and assumes a yellowish colour.

Chewed in the freshly-gathered state, it tastes first sweet and aromatic, then bitter, acrid, and pungent. It provokes abundant salivation, and in the course of a few seconds, occasions a sensation of burning on the tongue.

Ava is not much cultivated in Tahiti, the use of the drink being nearly obsolete. Some old men may still be met with, however, on the Peninsula who are unable to acquire a taste for our alcoholic liquors, and who, whenever a great occasion occurs, subject themselves to privations in order to save sufficient money to purchase a root of Ava, for which they sometimes pay as much as 5 piastres.

At the Marquesas, its cultivation is carefully attended to, and many varieties of the plant are found there. The natives drink, in company, every morning, one or more draughts of this inebriating beverage, but like the Tahitians, they prefer the most powerful intoxication produced by wine, gin, absinth, and brandy, to the milder effects of Kava. At the Tonga islands, this indigenous spirit has maintained all its ancient uses and reputation.

Method of Preparing the Kava Spirit.—The roots are chewed by girls, or in their absence, by boys. For this delicate operation only those are selected who have good teeth. Before commencing, they wash their mouths and hands, and arrange special vessels, of unexceptionable cleanliness, for the reception of the masticated root.

They never use any other than fresh roots, which chew very much better than the dry. The mastication is slowly performed, and no morsel of root is ejected until the fibrous tissue is thoroughly divided, and the whole forms a homogeneous bolus.

When the supply of Kava is chewed (the quantity varies according to the number of those who are to partake of it), the fibrous boluses, yellow and viscid with saliva, are

collected in a large bowl of wood, supported on three legs, called Umete,* and they are then mixed with a certain quantity of water, and gently squeezed by the hand. The mixture being effected, the ligneous particles, which float in the liquid, are removed by means of a handful of the filaments of the *Cyperus cinctus* (Môu), prepared at the time by crushing the green and tender stalks of the plant, and drawing them repeatedly between two pieces of wood. Passed with care and frequently through the liquid, the filaments collect the fibrous particles, and soon nothing is left in suspension except a tolerably large proportion of fecula. They sometimes use the fluid contained in the cocoa-nut instead of water, for mixing with the chewed root. The beverage is always served out immediately after its preparation, without allowing it to undergo the least fermentation.

Kava is essentially a fluid drink, and of by no means attractive appearance, uninviting especially to a person who has witnessed its preparation. The colour reminds one of café-au-lait; but sometimes, when the leaves of the plant have been chewed with the root, a green colour is imparted to the beverage, which gives it a resemblance to the liquor absinth, but it does not partake of the flavour of that liquor, as has been stated in the excellent article on the Islands of the Pacific (Océanie), published in the 'Revue Contemporaine.'

The aromatic odour of the Kava spirit rapidly attracts the little flies; the natives, therefore, take the precaution of covering the vessel containing it either with the leaf of the Taro (*Arum esculentum*), or with a piece of the leaf of the banana.

The flavour is at first sweet, it then tastes pungent and acrid. In some islands, the Kava root is mixed with very little water; its effects are then rapid, and half a cupful —that is, one of our glasses full—suffices to overpower the most robust of the natives. At the Marquesas, the draught is calculated by the number of mouthfuls of chewed root. Two mouthfuls mixed in a glass of water constitutes the ordinary dose for each individual. There are some drinkers, however, who mix three or four mouthfuls of it in that quantity of water. Intoxication follows then almost instantaneously. When the ordinary draught is taken, drunkenness does not ensue until twenty minutes after the draught has been swallowed, but its effects are immediate on those not accustomed to it. In many of the islands in the Pacific, Kava is given on the occasion of an official reception; it is the offered and accepted token of hospitality, a sign of alliance. Formerly the drinking of it always preceded warlike enterprises and religious festivals. It was a sign of peace, of reconciliation, or the object of a rich present.

At Nukahiva it is a daily beverage, analogous to our tea or coffee. Its use is interdicted to women and children. Taken in small doses, its effects are tonic and stimulating, and it imparts the power of supporting easily great fatigues. In large doses, it gives rise to a melancholy, silent, and drowsy state of drunkenness, quite different to that brought on by alcoholic liquors. The intoxication that it induces does not last longer than two hours, but if a person only takes it occasionally, the effects may continue for twelve. When taken at intervals of some days, the intoxication continues for six hours. The confirmed Kava-drinkers, in order to sustain their drunken state, imbibe it six or eight, or even more times a day. Arrived at the sixth or eighth dose, they are seized with a nervous tremor, so violent that they can no longer carry the cup to their lips, and require aid to enable them to continue tippling it, which they persist in. Different effects attend the drinking of Kava when made from the root grown in damp soils—the drinkers then remain plunged in a deep torpor, and become irritated by the least noise.

The effects of Kava have some analogy to those of opium, and the drinkers of it, like the Meriakis, may be seen borne down by the weight of their bodies.

A peculiar kind of skin disease, called at Tahiti *Arevareva*, results from the daily use of Kava. In old drinkers, the vision becomes obscure, the conjunctivas very red, the teeth acquire a deep yellow colour, their skin is dry, scaly, cracked, and ulcerated, especially where it is thick, as on the hands and feet, and they finish by falling into a state of complete emaciation and decrepitude.

The Nukahivians drink Kava as a remedy for phthisis, and they find it valuable for bronchitis, taking a small dose before going to bed at night.

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* Specimens of these vessels may be seen in the Museum at Kew.

A chemical examination of the root shows it to contain an essential oil of a lemon-yellow colour, combined with a balsamic resin. It is to this oleo-resin that some of the therapeutic effects described by Lenon are no doubt due. It also contains a large quantity of small rounded grains of fecula, and a neutral principle *Kavahine*. It is probably to this substance that the stupefying and intoxicating effects of Kava are to be attributed.

Kavahine may be prepared by treating the powdered root with alcohol, in a displacement apparatus, filtering the yellow liquor thus obtained, and concentrating it by distillation: the Kavahine then crystallizes out on cooling. When recrystallized from alcohol, and decolorized by animal charcoal, it is obtained in white tufts: these, on analysis by M. Roux, yielded—

Carbon	65·847
Hydrogen	5·643
Oxygen	28·510
	100·000

It may be distinguished from Piperine and Cubebine by the colour tests which it gives with acids. Hydrochloric acid colours it red, which passes by exposure to the air, into a bright yellow; concentrated sulphuric acid changes it a rich purple violet colour. This beautiful colour disappears at the end of some minutes, upon exposure to the air, and becomes greenish. Upon the addition of water, the mixture turns instantly to green. The results of experiments upon its remedial effects will be made known at a future period.—*From the Technologist.*

THE SARRACENIA PURPUREA:* A REMEDY FOR SMALL-POX.

BY FRED. W. MORRIS, M.D., PHYSICIAN OF THE HALIFAX DISPENSARY.

You have by this time, in all probability, heard something of an extraordinary discovery for the cure of small-pox, by the use of *Sarracenia purpurea*, or Indian Cup, a native plant of Nova Scotia. I would beg of you, however, to give full publicity to the astonishing fact, that this same humble bog-plant of Nova Scotia is the remedy for small-pox in all its forms, in twelve hours after the patient has taken the medicine. It is also as curious as it is wonderful that, however alarming and numerous the eruptions, or confluent or frightful they may be, the peculiar action of the medicine is such that very seldom is a scar left to tell the story of the disease.

I will not enter upon a physiological analysis now; it will be sufficient for my present purpose to state, that it cures the disease as no other medicine does—not by stimulating functional re-agency, but by actual contact with the virus in the blood, rendering it inert and harmless, and this I gather from the fact that if either vaccine or variolous matter be washed with the infusion of the *Sarracenia*, they are deprived of their contagious properties. The medicine, at the same time, is so mild to the taste that it may be mixed largely with tea or coffee, as I have done, and given to connoisseurs in these beverages to drink, without their being aware of the admixture.

Strange, however, to say, it is scarcely two years since science and the medical world were utterly ignorant of this great boon of Providence; and it would be dishonourable in me not to acknowledge that had it not been for the discretion of Mr. John Thomas Lane, of Lanespark, county Tipperary, Ireland, late of Her Majesty's Imperial Customs of Nova Scotia, to whom the Mecmac Indians had given the plant, the world would not now be in possession of the secret. No medical man before me had ever put this medicine upon trial, but in 1861, when the whole Province of Nova Scotia was in a state of panic, and patients were dying in the hospitals at the rate of twelve and a half per cent., from May to August, Mr. Lane, in the month of May, placed the *Sarracenia*

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* A communication from Mr. Herbert Miles, respecting this remedy, was read at a meeting of the Epidemiological Society, in the latter part of last year, and was noticed in this Journal, Vol. III. (2nd series) p. 323. Mr. Miles, who is assistant-surgeon to the Royal Artillery, was then quartered in Canada.—ED. PH. JOURN.

in my hands to decide upon its merits; and after my trials then and since, I have been convinced of its astonishing efficacy.

The Indian cup is found in swamps and moss bogs. Its capacious globular receptacles are generally filled with cool, bland water. The cups are lined with bristles, pointing downwards, that entangle the flies that come to drink, so that few escape drowning. It is a very curious and remarkable family of plants, exclusively North American, and not to be met with west of the Alleghanies. The leaves take the form of a long bulbous tube or funnel, like the bowl of a tobacco-pipe, terminating with a hood-shaped appendage not unlike an Indian squaw's cap. The flowers, with their hard involuted crenate calyx, and fine sessile segments, like the yellow water-lily, deep crimson stigmata, and corresponding stamina, in form and appearance are very remarkable. All of the tribe inhabit marshy grounds. The *Sarracenia purpurea* is the most common species, and like all the beautiful things of Providence, widely diffused from Hudson's Bay to the Carolina Northern State. The root consists of numerous short radicles, fibrous and stringy, which, when powdered, have a very faint and agreeable aroma, with a taste very like the willow alkaloid, or salicin. The dose of the medicine—the powdered root—is about a dessert-spoonful, simmered in a pint of water down to half a pint; this is divided into two doses, one taken immediately, the other in six hours; no sugar should be given with it. The only functional influence it seems to have, is in promoting the flow of urine, which soon becomes limpid and abundant, and this is owing perhaps to the defecated poison or changed virus of the disease exclusively escaping through that channel. The *Sarracenia* I take reason to believe a powerful antidote for all contagious diseases, lepra, measles, varicella, plague, contagious typhus, and even syphilis, also a remedy in jaundice. I am strongly inclined to think it will one day play an important part in all these.—*Amer. Med. Times.*

MISCELLANEA.

The Petroleum Bill.—This bill was read a third time, and passed on Wednesday, July 2. When in committee, on Tuesday, July 15, Lord Kingsdown moved an amendment to alter the definition of articles dealt with by the measure, so that it should stand, "any mineral product" giving off an inflammable vapour at 100 degrees Fahrenheit. The amendment was agreed to, and the bill passed through committee. An alteration has also been made in the regulations to be observed in storing petroleum: the quantity allowed to be kept is increased from 25 gallons to 40 gallons; and the distance diminished from "100 to 50 yards of a dwelling-house or of a building in which goods are stored."

Standards of Weights and Measures.—In the House of Commons, on July 15, Mr. Locke asked the Secretary of State for the Home Department, whether any communication had been received from the Astronomer Royal and the Comptroller-General of the Exchequer as to the inaccurate state of the standards of weight and measure; and whether those now in use at the Exchequer for testing the accuracy of the standards used by inspectors of weights and measures in all parts of the United Kingdom of Great Britain and Ireland have been so used since the year 1825; and if so, whether the same had been adjusted and reverified, or whether any other means had been adopted for ascertaining their accuracy; and if so, what means. Sir G. Grey said, from the information which he had received on the subject, he understood that no representations on the subject had been made since 1859, when they were laid before Parliament. In regard to the dates upon which the standards of weights and measures were first used, it appeared that the balances and standard of avoirdupois weight had been used since 1825, and the standard of measures had only been in use since 1854.

A New Gun-Metal.—The 'Messager du Midi' states that the new guns introduced by Austria on board her vessels, and the composition of which has been hitherto kept secret, are cast in an alloy called Aich metal, from the name of the inventor. This alloy is composed of 600 parts of copper, 382 parts of zinc, and 18 parts of iron. It is exceedingly tenacious, can be easily forged and worked, and will bear a consi-

derable inflexion when cold without breaking, its resistance being greater than that of iron of the best quality.

Production of Cork.—In the 'Mémoires de la Société de Physique' of Geneva is an interesting paper by M. Casimir de Candollè on the growth of cork. Although this useful substance exists in varying quantity in the bark of all phanerogamous plants and in several cryptogamous, yet for commercial purposes it is wholly procured from two species of oak, *Quercus occidentalis*, growing in the south-west of France and in Portugal and from *Quercus Suber* (the cork-tree), growing in the south-east of France, in Italy, in Algeria, and in the isles of the Mediterranean. The acorns of the former species take two years to ripen. In 1859 M. C. de Candolle, while staying in Algeria, studied the development of the bark of the latter species. It is composed of four layers—the epidermis, the corky envelope, the cellular envelope, and the liber which covers the soft wood. These four parts increase independently of each other year by year. In the third or fourth year the epidermis, having attained the limits of its elasticity, splits longitudinally, and a marked change takes place in the corky envelope, which gradually takes up the appearance of true cork: new layers are produced, and the transformation of cellulose into cork steadily goes on. The cork thus naturally developed has no commercial value. It is termed "male;" and the first act (*démasclage*) of the cultivator is to separate it from the trunk, which thus leaves exposed the liber, termed "mother." The tree is then left to itself, and the cork begins to grow again, whilst the sap is flowing in consequence of the exposure of the liber. If a trunk left in this state for several months be cut down, in the section a ring of cork will be found formed in the interior of the "mother," at a variable distance from the surface of the trunk. All the exterior portion of the "mother" is dead, and splits as the tree grows, and the interior portion (new cork, termed "female") is developed. This "female" cork grows in the same manner as the "male," that is, by the addition of annual layers on the internal surface; but it is much finer and more elastic, and is the cork of commerce. These various stages of growth are exhibited in a series of beautiful plates. In the course of his researches M. De Candolle was led to observe the importance of the desiccation of the "mother," and to infer that, in proportion as this desiccation could be hastened, so much sooner would fresh layers of cork be produced. This idea he found to be correct. He observed several trees in which fires, after having charred the male or female cork, had determined the formation of a layer of female cork in the interior of the "mother." He states that he has seen a specimen, composed of three layers of "female" cork, separated by little zones from the "mother;" the fourth layer, which enveloped the whole, having disappeared in consequence of the fire. The thickness of these zones, increased by the application of boiling water, does not diminish by cooling. Other peculiarities of this remarkable substance are noted in the memoir.—*Illustrated London News.*

Arsenic in Cheese.—On Tuesday, June 10, a number of members of the Burley Volunteer Corps partook of bread and cheese at Skipton, and shortly afterwards were seized with violent pains and symptoms of poisoning. The greater number rallied speedily, but four of the cases assumed a rather serious character. A portion of the cheese, which is said to have been American, has been submitted to Mr. Rimmington of Bradford, who found it contaminated with arsenic, and this contamination is thought to have occurred in the manufacture.

Poisoning by Strychnine.—Mrs. Vyse, who had been committed to Newgate on the charge of wilful murder of her two children by poison (see page 43), was tried before Mr. Justice Wightman, at the Central Criminal Court, on Wednesday, July 9. Mr. Chambers appeared for the prosecution, and Mr. Serjeant Ballantine for the prisoner. The plea urged for the prisoner was that of insanity, and several witnesses were called to prove that insanity existed in the family of the prisoner, both in the paternal and maternal side.

Dr. Forbes Winslow was also clearly of opinion that when the act was committed the prisoner was suffering under what is termed paroxysmal insanity. The jury returned a verdict of *Not guilty*, on the ground of insanity.

Mr. Serjeant Ballantine in his address alluded to the sale of "a mischievous powder called Battle's vermin-destroyer;" and was of opinion that the facility of obtaining

poisons concealed under innocent names was likely to produce disastrous effects upon persons whose minds were affected. Mrs. Vyse has been removed from Newgate to Bethlem Hospital, to be detained during her Majesty's pleasure.

Alleged Poisoning by Arsenic.—On Friday, June 27, at the Lambeth Police Court, Catherine Wilson, *alias* Catherine Taylor, who had been remanded from June 20, and who had been tried at the late session at the Central Criminal Court, on the charge of attempting to poison Mrs. Cornell, but acquitted, was now brought before the Hon. G. C. Norton, on the charge of causing the death of Mrs. Ann Atkinson, by administering poison. Mr. Chipperfield attended for the prosecution, and Mr. Neale for the defence. The following are the principal facts of the case as stated by Mr. Chipperfield, who was of opinion that, when the whole of the evidence was before the court, little doubt would remain that the deceased came by her death from Fowler's solution of arsenic. The prisoner had been six or seven years confidential servant to a medical gentleman in Lincolnshire, and had an opportunity, therefore, of becoming acquainted with the different poisons and their potency. It was not a little singular that, a very short time after her master had made his will in her favour, leaving her property in houses to the amount of £80 a year, he was seized with sudden and violent illness, and died. Soon after this the prisoner went to nurse a lady named Jackson, whom she induced to draw £150 from the Bank. Very soon after Mrs. Jackson died suddenly, and the money was missing. So strong were the suspicions excited in the case, that an investigation took place, and an inquest was held on the body. From the account of the inquest then before him it appeared the prisoner got off, owing to no irritant poison being discovered in the body. In the present case arsenical poison was discovered in the tissues of the body of Mrs. Atkinson by Mr. Nunneley, an eminent physician, who had examined it. Parts of the viscera had been forwarded to London by order of the Secretary of State for analysis, and at the conclusion of the present inquiry, he (Mr. Chipperfield) should have to call upon the magistrates for a further remand. It was proved by Mr. Atkinson, the husband of the deceased, that the prisoner, after the death of Mrs. Atkinson, said the deceased had been robbed at Rugby, yet witness heard nothing of the kind, although he was in attendance on his wife for several days before her death. Witness knew that deceased had from £100 to £130 on her person, yet all the money found was nineteen sovereigns and about twenty shillings in silver, in the dress pocket. The prisoner was remanded to Friday, July 4, when further evidence was adduced in support of the above charge and the prisoner was again remanded. There are two other charges against the prisoner, undergoing investigation, the case of Mr. Peter Mawer, with whom the prisoner lived as housekeeper, and who died under suspicious circumstances in October 1854, and that of Mrs. Soames, with whom also the prisoner lived, and who died in 1856.

Accidental Poisoning by Arsenic.—On Tuesday, July 8, Mr. William Payne Cowley, a farmer at Ashby St. Ledgers, near Rugby, sent his brother to the adjoining town of Daventry to purchase the materials for "sheep-dipping," consisting 6 lbs. of white arsenic and 30 lbs. of soft-soap. On the following morning, Mr. Cowley and his mother prepared the sheep-dipping mixture, in which some lambs were washed. In this operation Mr. Cowley and several of his labourers were employed. After assisting her son in the preparation of the arsenic and soap, Mrs. Cowley proceeded to make a batter pudding for the dinner of her family and servants. By some means, not yet ascertained, some of the arsenic must have become mixed with the pudding, for the whole of the persons, ten in number, who partook of it, became violently sick immediately after dinner, and exhibited all the symptoms of being poisoned. Medical assistance was procured, but one man died, and the others were in a precarious state. On Saturday, July 12, an inquest was held before Mr. W. Terry, coroner for the central district of Northamptonshire, on the body of the deceased, Richard Smith, and the inquiry was adjourned.

Suspected Poisoning by Strychnine.—On Tuesday, May 13th, an inquest was held at Clonmel, county Tipperary, on the body of Johanna Burke, wife of Richard Burke, the master of the Waterford Poorhouse, who, it is said, died from the effects of strychnine received—as the jury declared in their verdict—from the hands of her husband who was committed on the charge, and has since been tried and found guilty.

Death from an Overdose of Morphia.—An inquest has been held by Mr. Bedford, at the Devonshire Arms, Moreton-street, Belgravia, on William Johnson Bolwell, chemist and druggist, Moreton Place. The deceased left his home on the 23rd of May, and nothing more was heard of him by his friends until the following Saturday evening, when Mr. Heather, proprietor of a coffee-house in Charlotte Street, Buckingham Gate, waited upon Mrs. Bolwell, and producing a copy of the address, said that a gentleman with that address in his pocket had been taken ill and died at his establishment on that day. Medical evidence showed that death had been caused by an overdose of morphia. No light was, however, thrown on the cause of the deceased leaving his home in the way described. The jury eventually returned a verdict of "Died from apoplexy, induced by morphia, but how that poison was taken, whether medicinally or not, there was no evidence to show."

Suicide by Oxalic Acid.—On Friday, July 4, an inquest was held at the London Hospital by Mr. Walthew, deputy Coroner for Middlesex, on the body of Eleanor Hawks, aged forty-one. On the Saturday previous she was in a state of intoxication at Blackwall, and on the following morning purchased from Mr. Payne, chemist, Poplar, a paper of oxalic acid, and another of white precipitate, which she afterwards mixed with warm water, and drank. The inmates, roused by her groans, found her in great pain, and she was removed to the hospital, where she died. Mr. M'Kenzie, resident medical officer, said he had made a *post mortem* examination, and found the stomach inflamed. The papers labelled "oxalic acid" poison, and "white precipitate poison," were found upon her. The following dispute on the subject of fees then occurred in court:—Mr. Walthew: That will do, Sir. You can retire. That accounts for the death.—Mr. M'Kenzie: I have not signed the receipt for my fee.—Mr. Walthew: No. I will speak to you on the subject presently.—Mr. M'Kenzie: I wish to speak in open court before I leave.—Mr. Walthew: I request you to leave the room, Sir, or I will commit you for contempt of court.—Mr. M'Kenzie: I received an order from the coroner's officer to make a *post mortem* examination of the body of the deceased, and I claim my fee as a legally qualified practitioner.—Mr. Walthew (to the summoning officer): Remove that gentleman. I will not sit here to be grossly insulted and bullied. I sit here as representative of the Queen. If you are not removed, I will leave my seat, and retire from the court.—The officer proceeded to eject Mr. M'Kenzie, which he effected after some altercation. Mr. Walthew said the question of fees had been well considered by Mr. Humphrey, and it was held that when *post mortem* examinations were unnecessary, the coroner's act forbade the expending of the county money in fees. Mr. M'Kenzie had taken dudgeon at the result, and he wrote to the Home Secretary, who confirmed Mr. Humphrey's opinion.—A verdict of Temporary Insanity was returned.

Poisoning by Santonine.—Dr. Lohrman (*Journ. de Chim. Med.*) records a case in which a mother gave to her child, three years old, about a grain of santonine in five lozenges, for the purpose of destroying ascarides. In a quarter of an hour the child was seized with violent convulsions; when seen by Dr. Lohrman, it was unconscious, with hot head and pupils enormously dilated. An emetic was given (without effect), a leech was applied to the temples, fomentations to the head, and a mustard poultice to the chest. In about three hours consciousness began to return, the convulsions ceased, and on the next morning the cure was complete. [The effects from one grain of santonine, as described above, are rather remarkable, as the dose is usually stated to be from four to six grains as a vermifuge.—Ed. Ph. J.]

BOOKS RECEIVED.

A Handbook of Volumetrical Analysis. By Robert H. Scott, M.A., etc. London: Longman, Green, Longman, and Roberts. 1862. 8vo, pp. 104.

The Half-Yearly Abstract of the Medical Sciences. January–June, 1862. Edited by Dr. Ranking and Dr. Radcliffe. London: John Churchill. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co.

TO CORRESPONDENTS.

New American Remedies.—Our numerous correspondents about these remedies, are referred to a short notice of them in the XVIth volume of the 'Pharmaceutical Journal,' page 268, and to a paper on Eclectic Pharmacy, by Mr. J. W. Cleave, in our last volume. For a detailed description, see a paper on *Actæa racemosa* (Pharm. Journ. Vol. II. 2nd Series, page 460), and the papers now in course of publication in the 'Pharmaceutical Journal' by Professor Bentley.

Inquirer (Howden).—(1) Hooper's 'Physician's Vade-Mecum.' (2) Tomes's 'Manual of Dental Surgery.'

H. B. C. (Bristol).—A permanent "Red Show Colour" may be made by adding a solution of carbonate of ammonia to a solution of pure muriate of cobalt, until the hydrated precipitate is redissolved. See Vol. III. page 341.

Scion (Paisley).—The article sold as "Nepenthe" is a preparation from opium, made by Messrs. Ferris and Co., Bristol. There is no published formula for its preparation.

J. H. (Salford).—It will be seen that the Society has used its influence in the matter.

The Assistant to the Professor of Chemistry, Medical College, Calcutta, is thanked for his communication; the report on the collection of drugs in use in Bengal has not been received.

Mr. H. M. Dunwell, Resident Dispenser, Radcliffe Infirmary, Oxford, sends the following formula for *Unguentum Hydrargyri Nitrico-Oxydi*, as an improvement on that of the Pharmacopœia; the ointment retaining its colour and consistence:—Take Ceræ albæ, ℥ss; Olei Ricini opt., ℥iijss; Hydr. Nitrico-Oxydi, ℥ss; melt the wax in the oil with a gentle heat, and when cool, stir in the nitric oxide of mercury in fine powder.

Chemicus (London).—(1) Yes. For particulars apply by letter to the Director-General of the Army Medical Department, Dr. Gibson, Whitehall.

Beaver (Beverley).—*Baking Powder:* Tartaric acid, ½ lb.; bicarbonate of soda, and potato farina, of each ¾ lb.; these powders are separately dried by a gentle heat, and then mixed in a dry room.

G. B.—Hardwich's 'Photographic Chemistry' (Churchill).

Sarnia (Guernsey).—'Pharmaceutical Latin Grammar' (Groombridge) may be obtained through any bookseller.

A. C. H. (Rochdale).—*Counter Practice.* See Vol. III., 2nd Series, page 297.

Pharmakon (Leicester).—(1) We are unable to give any definite information on the subject; it is uncertain when the work will appear. (2) "*Third class medical men.*" We presume that our correspondent alludes to the alteration in the bye-laws of the College of Physicians, by which a new class of medical men were admitted under the denomination of Licentiates,—having the privilege of acting as General Practitioners, and supplying medicines to their own patients only. This regulation has been in operation about two years, and, we believe, with success.

F. W. (Belper),—The following books would be suitable:—'Latin Pharmacopœia,' 'Selecta è Prescriptis,' 'Pharmaceutical Latin Grammar,' Bowman's 'Introduction to Practical Chemistry.'

S. M.—The letters M.R.P.S. do not correctly designate a Member of the Pharmaceutical Society; there is no such body as "*Royal* Pharmaceutical Society." Particulars of the cases referred to should be sent to the Secretary, 17, Bloomsbury Square.

M. P. S., An Inquirer.—The Pharmaceutical Society is the recipient of the medal, but the credit attached to it is equally divisible among all those who contributed specimens to the collection.

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, ELIAS BREMRIDGE, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. III.—SEPTEMBER 1st, 1862.

THE JURIES BILL.

This Bill, to which in former numbers we have more than once referred, while its provisions were being discussed, has now become an Act of Parliament, 25 & 26 Vict. c. 107, entitled, "An Act to give greater facilities for summoning persons to serve on Juries, and for other purposes relating thereto;" and the friends and supporters of Pharmaceutical education may congratulate themselves and the cause to which they are attached, and with which they have, many of them, been for a long time identified, upon the encouragement afforded by this Act to the objects for which they have been labouring with so much zeal, and sometimes with so little apparent effect. The exemption of Registered Pharmaceutical Chemists from liability to serve on all juries and inquests is a very important concession to the just claims of the body of men who now enjoy this privilege, and it may also serve to indicate the advantage resulting from the adoption of certain principles which have been recognized, advocated, and adopted by the Pharmaceutical Society. It was upon the ground of professional qualification, tested by examination, that Pharmaceutical Chemists were enabled to urge their claim to exemption, with better effect than others who had neglected to afford this evidence of their power to serve the public; yet professional qualification alone would not have been sufficient, it was necessary that the qualified men should be readily identified, and, for this purpose, registration came in to their aid: but even with claims admitted and conditions favourable for identification, the final attainment of the object required the mechanism of a well-organized institution to overcome the difficulties which presented themselves at almost every step, and which had more than once nearly frustrated the attempt.

In our last number we described the opposite decisions which had been arrived at by the two Houses of Parliament. It was then a question, after the rejection of the Lords' Amendments, by the casting vote of the Speaker in the House of Commons, what course the Lords would pursue; and we were unable to give the result, as the question came on for consideration before the Lords on the 28th of July, on which day our journal was being printed. The following is a pretty full report of what occurred:—

Lord Wensleydale, after reading the second clause of the Bill, said their lordships had amended it by adding words which exempted the registered Pharmaceutical Chemists from serving on juries, and he thought it a wise alteration of the law. Physicians and Surgeons had, in consequence of their being often required in cases of great emergency, been exempted from these duties; and he could not see any reason why the members of the Pharmaceutical Society, which consisted of only about 2000 members, should not be placed in the same category. These gentlemen were employed in very responsible and delicate duties in making up prescriptions, and it was desirable that they

should not be called away from these duties to attend at distant places as jurymen. He thought the Commons scarcely understood what they were doing in rejecting this amendment. There were about 40,000 persons employed as Chemists and Druggists, who no doubt made up prescriptions, but those gentlemen did not undergo any examination, nor were they members of a registered society. It was not intended to apply the exemption to them. He should now move that the alterations made in the Bill by the Commons, so far as they affected or concerned the registered Pharmaceutical Chemists, be not agreed to, but that the amendments made in that respect by their Lordships be insisted upon.

The question was then put, "that all the words which related to the Pharmaceutical Chemists be retained in the Bill," and it was declared that the "Contents" had it.

Lord Denman then begged to move that the amendments made by the Lords in favour of exempting Veterinary Surgeons, who were much fewer in number than Pharmaceutical Chemists, and who often rendered service in saving the lives of animals, should be insisted upon. They were not much wanted on juries, and they often gave important evidence on trials at the assizes and sessions. The words ought to be retained. On the question being put, the "Not-Contents" had it.

This was a result we had referred to as not improbable, and it seemed to offer the best prospect of obtaining the consent of the House of Commons to the retention of the words exempting Pharmaceutical Chemists, by omitting the exemption of Veterinary Surgeons. No objection was on any occasion offered to our application in the House of Lords, and as the principal objection urged in the Commons was founded upon the inconvenience of removing so many good names from the list of jurors, it was hoped that now this number was reduced the objection would be overcome.

On the 31st of July, the re-assertion by the Lords of the claims of Pharmaceutical Chemists to exemption from serving on juries was reconsidered by the Commons. This was felt to be the final struggle, at least for this year. Sir George Grey having intimated that it was not his intention to offer further opposition to the Lords' amendment in its altered form, it was hoped the difficulty had been overcome; but it was soon discovered that opposition was to be raised from another quarter, and, when the question came on for discussion, it was moved by Mr. Edward Craufurd, "That this House doth insist upon its disagreement to so much of the Lords' amendment, in page 1, line 13, as their Lordships insist upon." The question being thus raised, a short but spirited discussion took place upon it, in the course of which Sir G. C. Lewis and Sir G. Grey supported the motion, while several members warmly advocated the Lords' amendment. On a division, the numbers were announced to be—Ayes 12, Noes 45. Including the tellers, two on each side, the numbers were 14 for and 47 against the motion, thus giving a majority of 33 in favour of the proposition to exempt Pharmaceutical Chemists: and that in a House in which there were five members of the Government present, all of whom voted in the minority.

The following is the list of members who voted in this division:—

AYES.

Ayrton, Acton Smee.
Cox, William.
Dunbar, Sir William.
Gladstone, Rt. Hon. W. (Oxford Univ.)
Greene, John.
Grey, Rt. Hon. Sir George (Morpeth).
Lewis, Rt. Hon. Sir G. C. (Radnor).
Martin, James (Tewkesbury).
Miller, Taverner John (Colchester).
Palmer, Sir Roundell (Richmond).
Palmerston, Viscount.
Proby, Lord.

Tellers for the Ayes, Mr. Edward Craufurd and Mr. M. E. Grant Duff.

NOES.

Astell, John Harvey.
Aytoun, Roger Sinclair.
Barrow, William Hodgson.
Beaumont, Somerset A. (Newc.-on-T.)
Bentinck, G. Cavendish (Taunton).
Briscoe, John Ivatt.
Brocklehurst, John.
Butler, Chas. Salisbury (Tower H.).
Cecil, Lord Robert.
Cobden, Richard.
Crawford, Rob. Wygram (London).
Doulton, Frederic.
Evans, Sir De Lacy (Westminster).
Forster, Charles (Walsall).
Freeland, Humphry William.
Gaskell, James Milnes.
Gilpin, Charles (Northampton).
Glyn, Geo. Grenfell (Shaftesbury).
Goldsmid, Sir Francis Henry.
Gregson, Samuel.
Hadfield, George.
Headlam, Rt. Hon. Thos. Emerson.
Hennessy, John Pope.
Hibbert, John Tomlinson.
Hotham, Lord.
Laird, John (Birkenhead).
Lennox, Lord Geo. Gordon (Lyming.).
Monson, Hon. William John.
Ogilvy, Sir John.
Parker, Major Windsor.
Paxton, Sir Joseph.
Powell, John Joseph (Glasgow City).
Pugh, David.
Puller, C. W. Giles.
Shelley, Sir John Villiers.
Sheridan, Henry B. (Dudley).
Smith, Sir Frederick (Chatham).
Somerville, Rt. Hon. Sir W. Meredith.
Sullivan, Michael.
Tite, William.
Walcott, Admiral.
Whalley, George Hammond.
Williams, William (Lambeth).
Wood, Western (London).
Wyld, James.

Tellers of the Noes, Mr. Deedes and Mr. Selater Booth.

It must not be supposed that this very satisfactory result was obtained without great exertions being made to secure it. The Council with their secretary in London, and the local secretaries and members throughout the country, were actively engaged in urging upon Members of Parliament the importance of the question and the true merits of the claim made on behalf of the Pharmaceutical body. It is very certain, that without the vigilance, promptness, and energy displayed at head-quarters, without the influence brought to bear when and where it was most required, and without the support derived from the soundness of the principles upon which our claim was urged, the battle would not have been won, and we should not have had to congratulate the members of the Pharmaceutical Society upon the triumph thus achieved through the influence of *organization*, *registration*, and *qualification*.

THE JURIES ACT.

"An Act to give greater facilities for summoning persons to serve on juries, and for other purposes relating thereto. [*7th August*, 1862.]

"Whereas it is expedient to amend an Act passed in the Session of Parliament holden in the sixth year of the reign of his late Majesty King George the Fourth, intituled 'An Act for consolidating and amending the Laws relative to Jurors and Juries,' and also to give greater facilities for summoning persons to serve on any jury: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

"1. This Act may be cited as 'The Juries Act, 1862,' and shall be construed with and as part of the said recited Act, hereinafter termed the principal Act.

"2. All registered pharmaceutical chemists and managing clerks to attor-

neys, solicitors, and proctors actually practising, all subordinate officers in gaols and houses of correction, shall be and are hereby absolutely freed and exempted from being returned and from serving upon any juries or inquests whatsoever, and shall not be inserted in the lists to be prepared by virtue of the principal Act or of this Act.

"3. All the provisions of the principal Act relating to the functions of high constables shall be and are hereby repealed, except as to any liabilities incurred before such repeal, and the duties of high constables as set forth in the principal Act shall cease and determine.

"4. The clerk of the peace in every county, riding, and division in England and Wales shall on or before the twentieth day of July in every year issue his precept (in the form set forth in the schedule to this Act, or as near thereto as may be) to the churchwardens and overseers of the poor of the several parishes, and to the overseers of the poor of the several townships, within the county, riding, or division for which he acts, requiring them to make out before the first day of September then next ensuing a true list of all men residing within their respective parishes and townships qualified and liable to serve on juries according to the principal Act, and also to perform and comply with all other the requisitions in the said precepts contained, and shall forward the same, together with a competent number of printed forms of returns, for the use of the respective persons by whom such returns are to be made, by post, in a registered letter having the words 'Jury Precept' legibly written or printed on the outside thereof, and addressed to the churchwardens and overseers as aforesaid; and every precept delivered or tendered as a registered letter at the address of the person to whom it is addressed, whether a receipt be given for the same or not, shall be deemed to have been served on the person to whom the same was so delivered or tendered, and if delivered or tendered to any one churchwarden or overseer of a parish or township shall be deemed to have been served on the whole of the churchwardens and overseers of such parish or township.

"5. The provisions of the principal Act as to the expense of printing the warrants, precepts, and returns therein mentioned shall apply to the printing of the precepts and returns required by this Act; and the precepts and jury lists required to be posted and registered by this Act shall be posted and registered at the expense of the county, riding, or division.

"6. After the receipt of such precept from the clerk of the peace, the duties of the churchwardens and overseers with reference to the jury lists, and the penalties to which they are liable for making default therein, shall be in all respects the same as if the words 'clerk of the peace' had been substituted for the words 'high constable' in the 8th section of the principal Act.

"7. No notice shall be sent to the high constable of the holding of a special petty sessions for the production of the jury lists, as required by the 10th section of the principal Act.

"8. It shall be lawful for the justices of the peace then present to adjourn any special petty sessions held under the provisions of the 10th section of the principal Act to any day within seven days thereafter, for the production of the jury list for any parish or township which, through the default of any churchwarden or overseer, has been omitted to be produced at such special petty sessions, and notice shall be sent by the clerk to such justices to such churchwardens or overseers requiring them to produce the said list at such adjournment.

"9. It shall be the duty of the clerk to the justices of the peace in every petty sessional division in England and Wales to take charge of the jury lists of each parish and township within such division, when and as soon as

they shall have been allowed and signed by the said justices, as by the principal Act provided, and to forward the same by the next available post in a registered letter or letters, with the words 'Jury List' legibly written or printed on the outside thereof, addressed to the clerk of the peace for the county, riding, or division, at his office, together with a schedule of the parishes and townships for which jury lists have been then allowed, which schedule shall be signed by one of the said justices, and the clerk to the justices shall be entitled to the fee of two shillings and sixpence, to be paid out of the county rate, for the discharge of the duties hereby imposed upon him.

"10. The duties of the clerk of the peace with reference to the jury lists so forwarded to him by the clerks to the justices, and the penalties to which he is liable for making default therein, shall be in all respects the same as if this Act had not passed, and the said lists had been returned by the high constables to the court of quarter sessions under the provisions of the principal Act.

"11. Any person liable to serve on any jury may be summoned as heretofore, or in the manner following: that is to say, the sheriff or other proper officer may make out a summons and affix the seal of his office thereto, and such summons, having the words 'Jury Summons' legibly written or printed on the same side as the address, may be sent open by the post, prepaid, and directed to the person so required to serve as juror at his place of abode as described in 'The Jurors Book,' which said summons, together with a duplicate endorsed with the name and address of the juror to whom the original summons is directed, shall be taken to the postmaster of any post-office where money orders are received or paid, within such hours as shall have been previously agreed upon at such post-office, and under such regulations with respect to the registration of such summons and the fee to be paid for such registration (which fee shall in no case exceed twopence over and above the ordinary rate of postage) as shall from time to time be made by the Postmaster-General in that behalf; and in all cases in which such fee shall have been duly paid, the postmaster shall compare the address of the said summons with that of the duplicate, and on being satisfied that they are alike shall forward the summons to its address by the post, and shall return the duplicate to the party bringing the same, duly stamped with the stamp of the said post-office; and the production by the party who posted such summons of such stamped duplicate shall be evidence of the summons having been delivered at the dwelling-house of the person whose name and address is thereon endorsed, at the place mentioned in such endorsement, on the day on which such summons would, in the ordinary course of post, have been delivered, provided it shall appear that the same was not returned by the post-office as undelivered; and any summons sent by the post as before mentioned, and not so returned as undelivered, shall be considered in all respects as duly served; and in the event of any person to whom any summons shall be addressed being ascertained to be dead, or to have permanently left the place to which such summons is addressed, the postmaster or letter-carrier of the place in which the summons shall then be shall endorse thereon the reason of the non-delivery thereof, and forward the same in the usual course of post to the Returned Letter Office in London, in order that it may be returned to the sender: Provided always, that when any summons shall be served by post under the provisions of this Act, two additional days shall be allowed for the transmission of such summons by post, over and above the number of days required by law for the service of a summons, before the day on which the juror is required to attend.

"12. Whenever any fine shall be imposed upon any person for not attending as a juror in obedience to a summons in that behalf, it shall not be lawful to estreat the said fine until after the expiration of fourteen days, and in the meantime the proper officer of the court by which such fine was imposed shall

forthwith, by letter, inform the said person of the imposition of such fine, and require him, within six days after the date of such letter, to forward him an affidavit of the cause, if any, of his non-attendance; and such officer shall, upon the receipt of any such affidavit, submit the same to the said court, or the judge or chairman who presided at the said court at the time when such fine was imposed, and such court, judge, or chairman shall have power to remit such fine.

"13. The costs incurred by any sheriff in summoning jurors by post, under the provisions of this Act, so far as the same shall not exceed the sum allowed to such sheriff, or his predecessor in office, on that account, in any one year within the three years immediately preceding the passing of this Act, may be included in his ordinary bill of cravings, and shall be allowed by the Commissioners of her Majesty's Treasury.

"14. This Act shall not extend to Scotland or Ireland; and nothing in this Act contained shall alter or affect the mode of procedure heretofore pursued in the making out of jury lists or the summoning of jurors in the City of London.

"15. This Act shall come into operation on the tenth day of August, 1862.

SCHEDULE.

Precept for returning Lists of Jurors.

County of _____ } to wit. Hundred of _____ } To the Churchwardens and Overseers of the Poor of the Parish [*or*, To the Overseers of the Poor of the Township] of

"You are hereby required to make out, before the first day of September next, a true list in writing in the form hereunto annexed, containing the names of all men, being natural-born subjects of the Queen, between the ages of twenty-one and sixty, residing within your parish [*or* township] qualified to serve upon juries; that is to say, of every such man who has in his own name, or in trust for him, a clear income of ten pounds by the year in lands or tenements, whether of freehold, copyhold, or customary tenure, or of ancient demesne, situate in the said county, or in rents issuing out of any such lands or tenements, or in such lands, tenements, and rents taken together, in fee simple or fee tail, or for his own life, or for the life of any other person, and also of every such man who has a clear income of twenty pounds by the year in lands or tenements situate in the said county, held by lease for the absolute term of twenty-one years, or some longer term, or for any term of years determinable on any life or lives, and also of every such man who is a householder in your parish [*or* township], and is rated or assessed to the poor rate or to the inhabited house duty on a value of not less than twenty pounds [if in Middlesex thirty pounds], and you are required to make out the said list in alphabetical order, and to write the Christian and surname of every man at full length, and the place of his abode, his title, quality, calling, or business, and the nature of his qualification, in the proper columns of the forms hereunto annexed, according to the specimens given in such columns for your guidance.

"And if you have not a sufficient number of forms, you must apply to me for more; and in order to assist you in making out the list you are to refer to the poor rate, and you may, if you think proper, apply to any collector or assessor of taxes, or any other officer who has the custody of any house tax, land tax, or other tax assessment for your parish [*or* township], and take from thence the names of men so qualified: and in making such list you are to omit the names of all peers, all judges, all clergymen, all Roman Catholic

priests who shall have duly taken and subscribed the oaths and declaration required by law; all ministers of any congregation of Protestant dissenters whose place of meeting is duly registered, provided they follow no secular occupation except that of a schoolmaster, and produce to you a certificate of some justice of the peace of their having taken the oaths and subscribed the declaration required by law; all serjeants and barristers at law, all members of the society of doctors of law, and all advocates of the civil law, if actually practising, and all attorneys, solicitors, and proctors, if actually practising, and having taken out their annual certificates, and their managing clerks; all officers of the courts of law and equity, and of the Admiralty and ecclesiastical courts, if actually exercising the duties of their respective offices; all coroners, all gaolers and keepers of houses of correction, and all subordinate officers of the same; all members and licentiates of the Royal College of Physicians in London, all members of the Royal Colleges of Surgeons in London, Edinburgh, and Dublin, and apothecaries certificated by the court of examiners of the Apothecaries' Company, and all registered Pharmaceutical Chemists, if actually practising as physicians, surgeons, or apothecaries, or pharmaceutical chemists respectively; all officers of the navy and army on full pay; the master, wardens, and brethren of the corporation of Trinity House of Deptford Strond, and their clerks, officers, and servants; all pilots licensed by the Trinity House of Deptford Strond, Kingston-upon-Hull, or Newcastle-upon-Tyne, and all masters of vessels in the buoy and light service employed by either of these corporations, and all pilots licensed under any Act of Parliament or charter for the regulation of pilots; all the household servants of her Majesty; all commissioners of property and income tax; all officers of the Post Office; all officers of customs and excise; all sheriff's officers, high constables, and parish clerks; all officers of the rural and metropolitan police; and also all persons exempt by virtue of any Act of Parliament, prescription, charter, grant, or writ.

"And when you have made out such list you are authorized to order a sufficient number of copies thereof to be printed, the expense of which printing will be allowed you by the parish [*or* township], and you are required, on the three first Sundays in September next, to fix a copy of such list, signed by you, on the principal door of every church, chapel, or other public place of religious worship within your parish [*or* township], and also to subjoin to every such copy a notice to the following effect, inserting the time and place, of which you shall be previously informed: 'Take notice, that all objections to the foregoing list will be heard by the justices in petty sessions on the day of September next, at the hour of at ;' and you must allow any inhabitant of your parish [*or* township] to inspect the original list, or a true copy of it, during the three first weeks of September next, gratis; and you are also further required to produce the said list at such petty sessions, and there to answer on oath such questions as shall be put to you by her Majesty's justices of the peace there present touching the said list; and these several matters you are in nowise to omit, upon the peril that may ensue.

"Given under my hand at in the said county the day of in the year

"Clerk of the peace.

"The form of precept in Wales is to be altered according to the difference of qualification."

CLAIMS FOR EXEMPTION FROM SERVING ON JURIES.

The Juries Act, by which Pharmaceutical Chemists are exempted from serving on juries, came into operation on the 10th of August; and it appears that at that time arrangements had been made for the preparation of the Jury Lists for the present year without reference to the new class of exemptions. Pharmaceutical Chemists, however, can still claim exemption; but to enable them to do so with effect, it will be necessary for them to be provided with certificates of registration. These are furnished by the Registrar and Secretary of the Society, on application being made to him, accompanied with a stamped envelope and twelve postage-stamps.

The following letter from the solicitors will show that immediate steps were taken to inform the Clerks of the Peace, but that the information was not in time to be acted upon this year:—

"9, Mincing Lane, London, 13th August, 1862.

"*To the President and Council of the Pharmaceutical Society of Great Britain.*

"In order to secure to Pharmaceutical Chemists the benefit of the exemption from service on juries recently enacted by 25 & 26 Vict. c. 107, we have communicated with the Clerks of the Peace of counties, and have ascertained that it is too late for them in the present year to convey to the churchwardens and overseers of parishes information respecting the exemption; it therefore remains for the Society, through its ordinary channels, to convey to Pharmaceutical Chemists the information that they are entitled to claim exemption, and that they must individually make claim to exemption before the jury lists for the year are finally settled. By the Pharmacy Act (15 & 16 Vict. c. 56) your Registrar is bound to issue to every applicant (for a fee of one shilling) a certificate stating whether the person named and described is or is not a Pharmaceutical Chemist; and such certificate is made evidence. We recommend that each Pharmaceutical Chemist shall have such a certificate, and produce it on all occasions when he claims exemption.

"We are, Gentlemen, yours obediently,

"Flux and Argles."

LAWS AND BYE-LAWS IN OPERATION.

The year 1862 will form no less important an epoch in the history of the Pharmaceutical Society than the years 1843 and 1853. These latter were the years in which the charter was granted and the Pharmacy Act was passed; but after those concessions had been obtained, the one from the Crown and the other from Parliament, it was not unfrequently asked, What benefit do we derive from a charter of incorporation, or from the exclusive right to use the title "Pharmaceutical Chemist"? In course of time certain privileges and advantages were found to be attached to the title held under the Act of Parliament, but still it was doubted by some whether these were not dearly paid for. What encouragement is there, it has been asked, for young men to spend the time and incur the expense necessary to qualify them for passing the examinations? Much of the knowledge they acquire for this purpose is forgotten again, and when they have completed their qualification, as required by law, and begin to look for the return in the shape of income which they have a right to expect from the capital invested, comparing themselves with those who have stopped short of the legal qualification, they find little more than a

nominal difference, and are dissatisfied with the result. We might perhaps be able to show that this is a superficial way of viewing the subject, but it is one nevertheless that too many adopt. Now in future they will have to include among the advantages which the qualified men possess, one of a very palpable nature, which is conceded to them by the Juries Act of 1862. The exemption of Pharmaceutical Chemists from liability to serve on juries is a privilege, the value of which will be fully estimated by all who possess it. In addition to the sacrifice of time and pecuniary interests that will be thus saved, what better means could have been devised for advertising the qualifications of Pharmaceutical Chemists, and directing public attention to the points of distinction between such and those who use the title only of Chemist and Druggist? Once a year every householder receives a paper, headed "Jury List," in which he is required to make sundry entries, and among the instructions at the bottom of the paper he will find that members of the clerical, the legal, and the medical professions, together with registered Pharmaceutical Chemists, are exempted from serving on juries. The question will very naturally arise, What are Pharmaceutical Chemists? Is every Chemist a Pharmaceutical Chemist, and, if not, what is the difference between a Chemist and Druggist and a Pharmaceutical Chemist? It cannot be supposed that the difference is merely nominal which the Legislature has so prominently marked. We have no doubt, and indeed we sincerely hope, that those who are entitled to the distinction will not fail henceforth to use the title, and thus enable the public to determine who are Pharmaceutical Chemists. They are a body of men who, having in 1841 formed a voluntary association "for the purpose of advancing CHEMISTRY and PHARMACY, and promoting an uniform system of education of those who should practise the same," obtained a charter of incorporation in 1843 as an educating and examining body, were empowered by Act of Parliament in 1853 to carry out all the previous objects of the Association, and in addition to form and maintain a Register of qualified Pharmaceutical Chemists, and now, in 1862, they have been again recognized by the Legislature, and admitted to the enjoyment of an important privilege, which they possess in common with the members of the medical and other learned professions.

The year in which this concession, not inappropriately designated "the druggists' franchise," has been obtained, is also marked by the introduction of important changes in the bye-laws of the Pharmaceutical Society. After much deliberation and discussion, a code of bye-laws has been framed, which has received the unanimous assent of the members. Some of these laws require the attention of those belonging to the Society as well as of those who contemplate joining it. In framing these bye-laws, the Society has acted with strict justice towards all parties. Those who joined the Society under bye-laws requiring no annual subscription in addition to the fee paid on admission, are allowed to retain their position on the same terms, although it has been found necessary for the carrying out of the important objects of the institution, that an increased rate of payment should be required in other cases. The points to be especially observed are the following. According to clause 13 of section 1 of the new bye-laws, "All persons who, prior to the first day of October, 1862, shall have become Associates, apprentices, or students, after examination, and who shall have paid their examination fees pursuant to the bye-laws then in force, shall be exempt from annual subscriptions to the funds of the Society, as Associates, apprentices, or students."

And according to clause 14 of the same section, "All persons who, before the first day of October, 1862, shall have paid fees on, and passed, the major examination, and who, by reason of registration as Pharmaceutical Chemists under the said Act of Parliament, qualify themselves to be elected Members

of the Society, shall upon election to membership, have the option of becoming Life Members, exempt from further contribution, on payment of a life subscription of five guineas."

Thus, all those who shall have joined the Society up to the 1st of October next, will pay according to the old scale of fees, but those who become connected with the Society afterwards will be subject to new regulations. In these regulations, it will be observed that those who have passed the first or classical, and the second or minor examination, as well as those who have passed the third or major examination, must, if they desire to become connected with the Society, make application for that purpose, and pay an annual subscription in addition to the fee paid on examination.

The following clauses of section 1 define the regulations in these respects:—

"6. Persons registered as assistants under section 10 of the said Act of Parliament, and desirous of becoming Associates of the Society, shall make application to the Council in that behalf.

"7. Persons registered as apprentices or students under section 10 of the said Act of Parliament, shall be eligible for admission as apprentices or students of the Society, and, if desirous of being admitted accordingly, shall make application to the Council on that behalf.

"8. All persons on election as Members, Associates, or apprentices or students, shall sign a written declaration, stating their full names and addresses, and their willingness to comply with the regulations of the Society.

"9. All persons who have become Life Members of the Society pursuant to bye-laws which have heretofore from time to time been in force, shall be exempt from further contributions to the funds of the Society.

"10. All Members of the Society, except Life Members, shall pay an annual subscription of one guinea.

"11. All Associates and apprentices or students of the Society, shall pay an annual subscription of half-a-guinea."

Hitherto, by a strange oversight, Associates and apprentices who have passed the examination have been allowed to enjoy the advantages afforded by the Society, including the supply of the Journal, without their making any special payment to the Society; and some of these have continued in that position for a much longer period than an ordinary apprenticeship or pupilage. In future, the regulation adopted in such cases will be in accordance with the following resolution of Council:—

"That the free issue of the Pharmaceutical Journal to apprentices and Associates registered as such between the 1st July, 1853, and the 1st October, 1862, be discontinued at the end of five years from the date of their respective registrations."

THE DRUGGISTS' FRANCHISE.

(*Extracted from the Lancet.*)

An important encouragement has been given by a recent Act of Parliament to that educational organization of the druggists and dispensing chemists which we hold to be a measure that should be made universal. At one time, the body of chemists were entirely without organization; and any little chandler-shopkeeper who chose to add drugs to his stock of tapes and dry-goods stood in the same position as the accomplished and practised gentlemen who had duly educated themselves for the responsible task of following the therapeutical indications of physicians, and dispensing drugs to the public. For some people this system of free trade in poisons has still many charms, and they would re-

morselessly leave the lives of the community in the hands of uneducated vendors of poison, such as that woman who sold pulv. opii Turc. for pulv. rhei Turc., under the impression that one kind of Turkey powder must be much the same as another, and as she was out of the "rhei," she might send the "opii," which she did, thereby killing her customer. We confess that we have no sympathy with the kind of vested interest in poisoning which is claimed for dispensers of drugs of this class. We look forward to the time when the interests of life will not be thus trifled with. In no country of Europe but in England is the fanciful respect for inherent trade rights carried to the absurd extent of permitting any ignorant fellow who pleases to start a shop for the sale of poisons and the dispensing of drugs; and without the shadow of education, or with any false measure of information which his conceit may lead him to think sufficient, then and there to practise medicine over the counter, and to dabble in death-dealing substances. There are two classes: the pharmaceutical chemists, who submit to such an examination as guarantees their capacity for dispensing and preparing medicinal substances; and the outsiders, who have given no evidence of that qualification. Amongst the latter there a number of very competent persons, but it is very well known that there are many of them who are totally and dangerously ignorant of the niceties of the difficult art which they practise: they include a kind of rabble of chandler-shopkeepers, stationers, perfumers, and others. When recently the Juries Bill was before Parliament, a clause was introduced by Mr. Powell exempting the pharmaceutical chemists—that is, chemists who are members of the Pharmaceutical Society—from serving on juries. This clause was rejected by the House of Commons; but by the wise persistence of the House of Lords it has found a place in the Act as passed. The pharmaceutical chemists were able to obtain this exemption by proving that they are a body which can be defined by educational examination and registration; that their business is of a most responsible nature; and that it is most difficult and dangerous for the principal to leave his business, more particularly where there are only apprentices, or where the establishment consists of the proprietor only, in which case, when he is summoned, the shop or dispensary is usually left to the wife (if he have one), or to porter or errand-boy. The awful announcement of the juryman in the celebrated case of Bardell *v.* Pickwick was an efficient argument for the cause which Lord Wensleydale pleaded with irresistible force. That chemist observed that he had "left nobody but an errand-boy in his shop. He is a very nice boy, my lord, but he is not acquainted with drugs; and I know that the prevailing impression on his mind is, that Epsom salts means oxalic acid; and syrup of senna, laudanum. That's all, my lord." The encouragement offered to the important educational efforts of the Pharmaceutical Society by this measure is very considerable, and we trust that it may have the effect of widening the influence of that Society, and raising the educational standard amongst druggists."

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 6*th August*, 1862,

Present—Messrs. Bird, Bottle, Davenport, Deane, G. Edwards, J. B. Edwards, Hanbury, Haselden, Hills, Lescher, Mackay, Morson, Sandford, Savage, and Waugh,

Mr. Robert Elliott, of Gateshead, was elected a Member.

THE "JURIES BILL," 1862, exempting Pharmaceutical Chemists from serving on any Jurics or Inquests whatsoever, having passed through Parliament, will come into operation on the 10th inst. A form of Certificatc was drawn up, and the Registrar will supply to cach Pharmaccutical Chcmist, on application and on payment of the fee of one shilling, a Copy of such Certificate of his Registration.

MAJOR EXAMINATION, 20*th August.*

Bailey, John Bassatt.....Reading.
Flesher, Sanderson .....Scarborough.
Kitchin, William Henry .....Whitchaven.
Marrack, Philip .....Crediton.
Ward, Joseph .....Nuneaton.
Welborne, George.....Grantham.

MINOR EXAMINATION.

Conder, George .....Walworth.
Kerfoot, Thomas .....Hyde.
Wilson, Thomas .....Stowmarket.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Barber, Harry	Messrs. Ward & Co..	Richmond, Yorks.
Doney, Francis Goss	Mr. Wagstaffe	James Strect, Westbourne Ter.
Iliffe, Thomas Perkins ...	Mr. Iliffe	Nuncaton.
Oakes, George.....	Mr. Paulden	Altrincham.
Park, John	Mr. Pratt	Bradford, Yorks
Selfe, William Gilbert ...	Mr. Allchin	Barnsbury Park.
Squirc, Peter W.....	Mr. Squire	277, Oxford Strcet.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG.

(*Continued from page* 56.)

V. JEFFERSONIA DIPHYLLA, *PERS.*—TWIN-LEAF.

History.—The rhizome and rootlets of this plant, under the name of Rheumatism-root, have long had a popular reputation in Ohio and some other North American States, as remedial agents in rheumatism, etc. Amongst medical practitioners the use of Rheumatism-root appears to have been almost exclusively confined to the class of Eclectics, by whom it is regarded as a stimulant, diaphoretic, diuretic, etc., and is recommended by them as a substitute for senega.

Synonyms.—This plant is the *Podophyllum diphyllum,* Linn., Willd., Hort. Kew.; the *Jeffersonia binata,* Barton, in Trans. Amer. Phil. Soc. vol. iii. p. 334, with a plate; *Jeffersonia Bartonis,* Michx., Fl. Bor. Amer. vol. i. p. 237; and the *Jeffersonia diphylla,* Persoon, Syn. vol. i. p. 418, Pursh, Fl. vol. i. p. 268, De Cand. vol. i. p. 111, Torr. Fl. vol. i. p. 399, Torr. and Gray, vol. i. p. 53, Bot. Mag. vol. xxxvii. tab. 1513, and Gray's Genera, vol. i. p. 85, plate 34. The latter name, being the one now generally used by

botanists and that by which it is known to the Eclectic practitioners, is adopted here. It is commonly known under the names of Twin-leaf, Rheumatism-root, etc.

The generic name *Jeffersonia* was given to it by Professor Barton, of the University of Pennsylvania, in honour of Thomas Jefferson, a former distinguished American statesman, and President of the United States. The specific name *diphylla*, is derived from δις, twice, or double, and φυλλον, a leaf, in allusion to the leaves of this plant being placed in pairs, and base to base. The common name of *Twin-leaf* is in like manner derived from the position and characters presented by the leaves; and that of *Rheumatism-root*, from its popular use as a remedy in rheumatism.*

Botany.—*Jeffersonia diphylla* was placed in the Natural Order *Podophyllaceæ* by De Candolle, and by Reichenbach in that of *Papaveraceæ*. It is now commonly included by botanists in the *Berberidaceæ*, to which Order the dehiscence of its anthers, and some other botanical characters which it presents, clearly indicate that it properly belongs; hence it has been described by us immediately following our notice of *Caulophyllum thalictroides*, Michx., also one of the *Berberidaceæ*.

Generic Character.—*Calyx* of 4, or rarely 3 or 5 sepals. *Petals* 8, or rarely 9. *Stamens* 8, or rarely 9. *Ovary* 1-celled. *Capsule* obovate, slightly stalked, 1-celled; dehiscing in a transverse manner half-way round, near the summit. *Seeds* numerous, unilaterally arillate at the base.†

Specific Character.—*Rhizome* horizontal, knotty, perennial, giving off below a number of long matted rootlets, and above, annually in early spring, a tuft of radical leaves, and naked 1-flowered scapes. *Leaves* radical, on long petioles, 2-partite or 2-foliolate, peltately-veined, glaucous beneath. *Scape* naked, 1-flowered. *Flowers* white, large, frequently an inch in diameter. *Sepals* 4, or rarely 3 or 5, deciduous. Petals 8, or sometimes 9, oblong, spreading, deciduous. *Stamens* 8, or rarely 9, with linear anthers supported on thread-like filaments. *Ovary* ovoid, tapering into a short style; *stigma* 2-lobed, undulate. *Pericarp* coriaceous. *Seeds* numerous, in several rows, oblong, on the broad lateral placenta, with a coriaceous testa, and a fleshy, laciniate aril.‡ This is the only species of *Jeffersonia* now recognised by botanists. In habit it resembles *Sanguinaria canadensis*. It generally flowers early in April.

Habitat.—This plant is only indigenous in North America, where it is found in calcareous soils in the Middle and Western States. Gray says,§—"The single species inhabits rich and cool woods, from Northern New York southward through the Alleghany Mountains, and in the Western States."

Collection.—The rhizome with its attached rootlets, is the part of the plant which is employed as a remedial agent. It should be collected for use in the autumn, about September, or early in October; or in the succeeding spring, in March, or the beginning of April.

General Characteristics.—The part employed in medicine, under the name of *Rheumatism-root*, is in reality, as already noticed, the rhizome with its attached rootlets; the name of root being in this case, as in *Actæa race-*

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* Gray's 'Genera of the Plants of the United States,' vol. i. pp. 84, 85; and Torrey and Gray's 'Flora of North America,' vol. i. p. 53.

† Gray's 'Genera of the Plants of the United States,' vol. i. p. 85; and Curtis's 'Botanical Magazine,' vol. xxxvii. tab. 1513.

‡ Gray's 'Genera of the Plants of the United States,' vol. i. p. 85; Torrey and Gray's 'Flora of North America,' vol. i. p. 53; and 'American Journal of Pharmacy,' vol. xxvii., or vol. iii. 3rd series, p. 1.

§ 'Genera of the Plants of the United States,' vol. i. p. 86.

mosa,* *Podophyllum peltatum*,† *Hydrastis canadensis*,‡ *Caulophyllum thalictroides*,§ improperly applied to the rhizome.

In commercial specimens of *Jeffersonia*, the rhizomes and rootlets are either distinct from each other, which is more commonly the case; or two or more are found adhering together, and forming dense entangled masses. The *rhizome* generally varies in length, from about one inch to two inches, or more. It is much twisted, and presents numerous projections, which give it a very irregular appearance. In thickness it varies commonly from the size of an ordinary writing-quill to that of the little finger, but occasionally it may be found as large as that of the middle finger. Its upper surface is very rough and irregular, and presents at short intervals projections of varying sizes and lengths, which are the remains of the scapes or aerial stems of former years. In colour it varies from yellowish-brown to blackish-brown. A transverse section of one of the projections exhibits three distinct regions: an *internal*, of a yellowish or brownish colour, surrounded by a yellowish or light straw-coloured fibrous zone,—the two together forming the meditullium; and an *external* or cortical portion of a dark brown colour, and somewhat resinous appearance. Its fracture is close and resinous. Its taste is at first bitter, somewhat mucilaginous, and faintly narcotic; but when the rhizome is chewed for a short time it becomes more or less acrid, pungent, and nauseous, and leaves behind it a somewhat burning sensation in the mouth and fauces, which has been compared to that produced from senega under similar circumstances. It certainly does resemble senega in this respect, but so far as our experience goes, the acridity is not so developed as in that substance. This taste is almost confined to the cortical portion, the meditullium being nearly tasteless. The odour is peculiar, and slightly narcotic.

The *rootlets* are very numerous, commonly several inches in length, more or less branched, and by interlacing with each other form entangled tufts. They are never of any great thickness, the largest not exceeding that of an ordinary knitting-needle, and far more frequently they are even of less diameter than this. They consist of a central cord or meditullium of a yellowish colour, surrounded by a brownish cortex. They are more less corrugated externally, and have a yellowish-brown colour. Their fracture is close. In taste and colour they resemble the rhizome already noticed above. The rootlets are commonly adherent to the rhizomes, and form a considerable proportion of the so-called Rheumatism-roots of commerce.

In appearance, the so-called *rheumatism-root* resembles the similar parts of Serpentary, Valerian, and Caulophyllum; but a careful examination of its general characteristics, as described above, ought to enable any one to distinguish it readily from those substances.

Composition and Chemical Characteristics.—According to the analysis of Mr. Edward S. Wayne,|| *Jeffersonia rhizome* and rootlets contain *albumen*, *gum*, *tannic acid*, *starch*, *pectin*, *fatty resin*, *hard resin*, *sugar*, *lignin*, a *peculiar acrid acid*, and a *bitter principle*. Mr. Wayne remarks,¶ "The analysis of this root shows that its chemical composition is somewhat similar to that of senega, and its sensible properties are somewhat analogous; like it, it possesses an acrid principle (the identity of which I do not pretend to say) upon which its expectorant property depends; it is, in large doses, emetic, and also has tonic properties." The active medicinal properties of Jeffersonia would

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* Pharm. Journ. vol. ii. 2nd ser. p. 46. † Id., vol. iii. p. 459.
‡ Id., vol. iii. p. 541. § Id., vol. iv. p. 53.
|| 'American Journal of Pharmacy,' vol. xxvii. or vol. iii. 3rd ser. p. 1; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1437
¶ 'Amer. Journ.,' as above, p. 7.

appear to depend therefore essentially upon the *acrid acid* and *bitter principle* which it contains.

An infusion of the mixed rhizome and rootlets previously bruised, in the proportion of half an ounce to twelve ounces of water, and allowed to macerate for twenty-four hours, presented a dark sherry colour, a nauseously bitter and slightly narcotic taste, and a peculiar and faintly narcotic odour. It exhibited the following reactions:—*Blue litmus-paper* was reddened by it; *solution of diacetate of lead* produced a yellowish-brown milky appearance, and precipitate; *tincture of iodine* caused a deep reddish-brown turbidity, and precipitate; *solutions of the perchloride* and *persulphate of iron* caused a deep blackish-brown coloration; *solution of sulphate of copper* had no evident effect upon the infusion; *solution of chloride of barium* caused an abundant whitish precipitate; *infusion of galls* had no marked change at first, but it ultimately produced a light abundant brownish precipitate; *solutions of gelatine* and *tartar emetic* caused no perceptible change in the infusion; *solution of ammonia* had no evident effect; *solution of corrosive sublimate* caused a precipitate; *hydrochloric acid* produced no marked change; *nitric acid* turned the colour of the infusion to a bright red, which, however, gradually disappeared when it was allowed to stand; *sulphuric acid* caused a deep blackish-brown coloration, and a whitish-yellow floating frothy precipitate. When heated, the infusion coagulated.

The application of either a *solution of ammonia*, or of *hydrochloric acid* to a section of the rootlet caused no perceptible effect; but that of *sulphuric acid* produced a blackish-brown coloration of its surface, and that of *nitric acid* a general reddish-brown coloration.

The reactions as above indicated, are remarkable, as they are almost identical with those of caulophyllum rhizome and rootlets, as already noticed.* From this it seems clear that the medicinal properties of the two cannot be very different. A more complete analysis of the two rhizomes is, however, desirable, but unfortunately we have no further specimens for examination. The near chemical relations of Caulophyllum and Jeffersonia is a further evidence of their botanical affinity.

Medicinal Properties and Uses.—As already noticed, it resembles senega in its chemical composition, and hence it may be expected to resemble it likewise in its medicinal properties. It would seem also, from its chemical reactions so far as we have been able to try them, being nearly identical with Caulophyllum, to have somewhat similar effects to that substance. It is commonly regarded as emetic in large doses, and tonic and expectorant in smaller doses.† It is also regarded as alterative and diuretic. It has been principally employed in rheumatism and syphilitic affections.

MINOR NOTES ON THE MATERIA MEDICA OF THE INTERNATIONAL EXHIBITION.

BY DANIEL HANBURY, F.L.S.

Contrayerva Root.—It has long been known to pharmacologists that this drug, as found in the shops, is not derived from *Dorstenia Contrajerva* Linn., but that it is usually the root of another species, *D. brasiliensis* Lam. The Exhibition, however, contains two specimens of contrayerva root which are

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* Pharm. Journ. vol. iv. 2nd ser. p. 55.

† Amer. Journ. Pharm. vol. xxvii, p. 7; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1437.

ascribed and, I have no doubt, correctly, to *D. Contrajerva*. One of them has been forwarded by M. Bélanger, of the Botanical Garden of St. Pierre, Martinique, the other by Mr. Devenish, of Trinidad. Dr. Crüger, the Colonial Botanist of Trinidad, states that the drug is in great repute among the Spaniards of the island as an alexiteric. Contrayerva root has become nearly obsolete in European medical practice, and, indeed, almost of necessity, for it is very scarce, and the little that can be found is usually old and worm-eaten. Were it necessary to re-introduce it, supplies could be obtained from Trinidad, in certain localities of which island, I am informed by Dr. Crüger, *D. Contrajerva* is abundant.

Pods of *Myrospermum*.—The Trinidad collection of drugs contains a good specimen of the entire legumes of *Myrospermum frutescens* Jacq., a tree known in the island by the name of *Guatamare*. These legumes are a very popular stomachic and carminative, and are also used externally in the form of tincture, for pains, etc. The tree which in Trinidad attains an altitude of from sixty to one hundred feet (and hence bears a very improper specific name), yields from incisions in its stem a small amount of balsamic resin which hardens in the air and is then undistinguishable from Balsam of Tolu. None of this resin is collected in Trinidad, where the tree is not very abundant and apparently not indigenous. Young plants of *M. frutescens*, raised from seeds sent by Dr. Crüger, may be seen in the Royal Gardens of Kew.

Pods of *Myrospermum*, having the posterior or winged portion broken off, are also sent to the Exhibition from Venezuela. No information accompanies them, except that they are called *Sereipa*, and are from the province of Guayana. Careful inspection shows that they are the produce of two species, the smaller pods being apparently those of *M. frutescens* Jacq., and the larger those of some other species which I cannot identify.

Manna.—Very few pharmacologists having seen any other form of this drug than that derived from the Manna ash (*Fraxinus Ornus* L.), it is peculiarly interesting to find among the Materia Medica of the Exhibition at least four other kinds of manna, namely the following :—

1. *Manna of the Oak*.—Mr. S. H. Maltass, of Smyrna, has sent, together with various other interesting drugs, a saccharine substance called *Diarbekir Manna* respecting which he has given me the following information, upon the anthority of a relative who resided for two years in Diarbekir. The manna is found upon the leaves of the dwarf oaks, from which it is collected by the peasants, who use it instead of butter in cooking their food, and ascribe to it no purgative properties, at least while it is fresh. The manna is deposited upon the trees much more copiously after misty weather than at any other period. The sample of oak-manna in the Exhibition constitutes a moist but solid mass of agglutinated tears, closely resembling some of the common qualities of ash-manna. Its taste is simply saccharine, and agreeable.

2. *Eucalyptus Manna*.—There are several specimens in the Exhibition of this substance, which is found in the form of small rounded opaque-white masses upon the leaves and younger branches of *Eucalyptus viminalis* La Bill. The exudation, which is said to result from the punctures of insects, takes place most copiously in the early part of summer, at which time the manna appears as a transparent liquid, resembling thin honey, and gradually solidifies. This Australian manna has not hitherto been collected for medicinal purposes.

3. *Australian Insect-Manna* called *Lerp*.—Having only recently obtained a specimen of this substance which to me was previously unknown, I am unable to offer much information respecting it. According to the *Victorian Exhibition Report* published at Melbourne this year, we find that the leaves of *Eu-*

calyptus dumosa Cunn., called by the colonists *Mallee Scrub*, become coated at certain seasons of the year with an opaque white saccharine substance in such profusion, that the shrubby vegetation has the appearance of being *iced*. This substance, which among the aborigines of the northern districts of the colony obtains the name of *lerp*, is the secretion of an insect of the *Psylla* family, and consists (judging from the specimen in my possession) of a series of depressed hemispherical cells, each from a tenth to a sixth of an inch in diameter, placed contiguous to each other, and adhering together so as to form irregular flakes, sometimes an inch or more across. These cells are composed of a semitransparent, colourless, or yellowish substance, which is somewhat smooth in their interior, but which on their external surface forms transparent woolly filaments, so closely interwoven that the outer surface of a flake shows no evidence of the cellular structure beneath. Each cell is the habitat of an insect, which when fully developed, escapes by boring a passage through the top of the cell to the outer air.

The *Lerp* Manna has an odour resembling manna of the ash, a similar colour and the same clammy feeling to the touch; it has a saccharine taste, but does not dissolve in the mouth. It is not wholly soluble in cold water or in cold alcohol; boiled in water, it breaks down so as to form a turbid mucilaginous liquid, which is coloured intensely blue upon the addition of iodine. Like the Australian manna previously noticed, the Lerp manna has not at present any useful application.

4. *Alhagi Manna* has been sent to the Exhibition from India. It is a saccharine substance in small, loose, dry grains of a pale brown colour, mixed with both leaves and pods of *Alhagi* (? *Maurorum* Tourn.). It therefore differs in appearance from the Syrian alhagi-manna, sent by Dr. Gaillardot, of Saida, to M. Léon Soubeiran, which the latter describes as compressed into loaves or cakes.

Cinchona Bark.—Neither Peru, Bolivia, Ecuador, nor New Granada have contributed any series of the Cinchona barks which are produced in their forests. There is however a fine general collection exhibited by Messrs. Howard and Sons, of London, and illustrated by drawings of the plants as well as by healthy living specimens of *Cinchona succirubra* Pav., *C. micrantha* R. et P., *C. Uritusinga* Pav., *C. nitida* R. et P., and *C. peruviana* Howard. Among the productions of the Dutch colonies are specimens of genuine Calisaya bark grown in Java, also of the bark of *C. Pahudiana* Howard, a species of very little medicinal value.

Balsam of Copaiba.—The specimen sent from Trinidad is interesting as being entirely produced by one species, namely *Copaifera officinalis* Jacq., a tree abundant on the south coast of the island. Balsam of Copaiba is not at present, I believe, an article of export from Trinidad.

Seeds of *Scaphium*: Boa-tam-paijang.— In a recent number of the 'Pharmaceutical Journal,'* I described and figured under the Chinese name *Ta-hai-tsze*, a drug which some years ago had an ephemeral reputation in Paris as a specific in diarrhœa and dysentery. From its resemblance to the fruits of certain species of *Erioglossum* and *Nephelium*, I conjectured it might belong to one of those genera, or at least to the Order *Sapindaceæ*. In May last, however, M. Decaisne requested me to examine whether it was not rather the *seed* of *Scaphium*, a genus of *Sterculiaceæ* in which the follicles enclosing the seeds are monospermous, very large and leaf-like, and open long before the seed attains maturity. The correctness of M. Decaisne's opinion was soon

* July, 1861, p. 6.

confirmed by specimens of *Scaphium scaphigerum* Wall. contained in the herbarium of the Royal Gardens of Kew, and in that of the Linnean Society, and no doubt remained that the seed of that plant constitutes the drug called *Ta-hai-tsze* by the Chinese, and *Boa-tam-paijang* and *Bung-talai* by the Siamese. The French collection of products from Cochin China includes a specimen of it, which in the catalogue is referred doubtfully to *Sterculia (Scaphium) scaphigera ;* it is stated, though probably in error, to be used in dyeing. It is also sent to the Exhibition from Siam.

Radix Behen.—This drug which held an important place in the medical writings of the Arab school, and which thence came to be introduced into most of the Pharmacopœias of Europe up to the commencement of the last century, was recently the subject of an interesting communication to the 'Journal de Pharmacie et de Chimie'* by Professor Guibourt, of Paris. There are two sorts of Behen, the *white* and the *red*, both of which have long been obsolete in Europe, though still found in the bazaars of the north-west of India, whence specimens have been sent to the Exhibition. White Behen is referred by all writers on materia medica to *Centaurea Behen* L., a plant of Persia and traditionally also of the Lebanon. Red Behen is generally attributed to *Statice Limonium* L., but the root of this plant, whether produced in Europe or in Asia, is so very different that I cannot suppose there is the least connection between it and the drug in question.

Amomum Fruits.—The Exhibition contains the fruits of several species which are not without interest to the pharmacologist. Thus we find fruits of *Amomum Cardamomum* L., and *A. xanthioides* Wall. sent from Siam and Cochin China; and fruits of *A. maximum* Roxb. from India. From the French settlements on the Gaboon River, come specimens of the fruits of *Amomum citratum* Pereira, a species of which we at present know very little, but which is remarkable for the agreeable lemon-like odour of its large angular seeds. The fruit of *A. Danielli* Hook. f., a very variable plant, common all along the coast of tropical Western Africa, is in one of the English collections, where we also find fruits of *A. latifolium* Afz., which are striking from their large size. *A. latifolium*, a native of Sierra Leone, was described by Afzelius in 1813 in his 'Remedia Guineensia,' published at Upsal, but it is a plant still almost unknown to botanists. There are specimens of two other fruits of *Amomum* from the Portuguese settlements on the west coast, which probably belong to undescribed species. Fruits of *Amomum Melegueta* Rosc., the seeds of which constitute the *Grains of Paradise* of the shops, are sent from the West Indies, where the plant, which has been introduced from Western Africa, thrives as well as in its native jungles. Lastly I may name as the most interesting of all, *Amomum Korarima* Pereira, the fruits of which have for ages been known as the *Greater Cardamom* (*Cardamomum majus*) though the name is now misapplied to Grains of Paradise. The true *Cardamomum majus*, which is figured and described in several of the older works on materia medica, is still an object of traffic in the East, and, strung upon strings, may still be seen adorning the stalls in the drug bazaar of Damascus. In Abyssinia it answers the purpose of a small coin, and as such it figures in the collection exhibited by the International Decimal Association. The seeds of *A. Korarima* are an agreeable aromatic, in flavour much resembling the seeds of the common Elettaria Cardamom, and entirely devoid of the burning taste of Grains of Paradise. The plant for which the late Dr. Pereira proposed the name *Amomum Korarima* is entirely unknown; it is supposed to be a native of east-

* Tome 31, p. 227.

ern Central Africa, whence its fruits are exported by way of Abyssinia and Massowah.

Root of *Statice latifolia* Sm.—Among the few drugs sent from Russia to the Exhibition, are specimens of the thick woody root of *Statice latifolia* Sm. (*St. coriaria* Pall.), which is remarkable for its compact substance and large size, so unlike what is usual in other species of *Statice;* this root I have recognized to be identical with that imported some years ago into Marseilles, and described by M. Guibourt in his 'Histoire des Drogues,' tome 2, p. 416. With respect to its production and uses, I have been favoured with the following remarks, by Mr. George Peterson, the Russian Commissioner of the Exhibition, who, as a member of the Scientific Committee for the Crown Lands of Russia, has the best opportunity for being correctly informed upon the subject. The "*Statice coriaria* of Pallas," says he, "grows wild in the whole prairie country of Southern Russia, known under the name of *steppes*, that is, land without forests. I have myself during two years travelled through this region, and seen roots of it of the length of more than thirty feet and with a top diameter of four and a half inches. The plant is also found in the north of the Crimea and in the southern part of Bessarabia, but in general it is more common in the eastern part of the prairie region near the Wolga, and to the east of this river. To dig out the roots is very difficult, because the subsoil is hard and cannot be worked with a pickaxe. The root penetrates the soil and subsoil in a nearly perpendicular line; the longest roots are discovered on steep river-banks, which are underwashed each spring-time by the swollen rivulets and also after heavy rains, the latter occurring very seldom. A small number of tanners have begun to employ the roots of *Statice*, but as the supply is precarious and the leather tanned with them brittle, no progress is made in utilizing this tanning material, which in more skilful hands has proved one of the best, as, for instance, in Spain."

ON THE MANUFACTURE OF CAUSTIC SODA.

BY A. NORMAN TATE, F.C.S.

(*Read at the Meeting of the Liverpool Chemists' Association held May* 15*th*, 1862.)

The manufacture of Caustic Soda, although at present quite in its infancy, will, I believe, soon become one of very great importance. To a great extent the use of caustic soda will supersede that of soda-ash, especially for soap making, as it will not only lessen the amount of labour, but will also materially reduce the amount of apparatus required, thereby considerably lessening the cost of plant, and also economizing space—two very important considerations to the manufacturer.

I am well aware that, as was the case with soda-ash, there are some difficulties to be surmounted before caustic soda becomes so generally used for soap-making and other purposes as soda-ash now is, and not the least of these is the prejudice of manufacturers. In the case of soda-ash the prejudice against its use was at first so great, that Mr. J. Muspratt had to give away tons of it, before he could get the soap-makers to employ it instead of the barilla, or kelp, which they were in the habit of using before the introduction of artificial soda.

I do not however anticipate quite so great an opposition to caustic soda, for, thanks to the diffusion of scientific knowledge, the manufacturers of the present day are to a great extent a different class of men to those of only a few years since, and we can now point to many of them who are eminent for their scientific attainments; and these scientific manufacturers—men who

combine a knowledge of science with practical skill—cannot fail to see the great advantage caustic soda has over soda-ash, and it will therefore come rapidly into use; indeed the consumption of this article increases daily.

Processes for Manufacturing Caustic Soda.—There are at present two or three processes employed for the production of caustic soda, and I shall now proceed to describe them.

In the manufacture of soda-ash, or carbonate of soda, by Leblanc's process, there is found in the liquors produced by lixiviating the black ash a certain amount of caustic soda, or hydrate of soda, mixed principally with carbonate of soda. In evaporating these liquors the carbonate of soda separates, and there remains a liquor containing nearly all the hydrate of soda. This liquor is technically known as "red liquor," owing to its being of a deep red colour from the presence of a deep red compound of sulphide of sodium and sulphide of iron. It was formerly, and is indeed even now in some works, the practice to carbonate this caustic liquor and evaporate it with the other liquors to make soda-ash, and in some cases this answers well; but when the soda-ash is used for soap-making, the practice appears rather anomalous, inasmuch as the carbonate of soda of the ash must again be reconverted into the caustic state.

In 1853, Mr. William Gossage, of Widness Dock, near Warrington, whose numerous discoveries and improvements in the alkali manufacture have largely contributed to raise it to its present important position, took out a patent for using this red liquor for the production of *solid* caustic soda; and I believe I am right in stating that the greater portion of the caustic soda now used is made from red liquor.

Mr. Gossage's Patent.—The following is a brief outline of the patent of Mr. Gossage, which includes the caustic soda process. He first of all oxidizes the sulphide of sodium of the black-ash liquors by bringing them in contact with atmospheric air in a tower filled with pieces of coke; the liquors trickle slowly down through the coke, whilst a current of air is caused to pass up. By the action of the oxygen of the air, the sulphide of sodium of the liquors is oxidized, and the sulphide of iron before held in solution is thus set free and precipitated. He next adds a small portion of chloride of lime, to oxidize any hyposulphite. The liquor is then concentrated, to obtain salts or carbonate of soda; these salts are washed either with water or a solution of carbonate of soda, and are then drained and roasted in the ordinary manner, to form soda-ash. The mother-liquors from which the salts have separated are concentrated until they have a specific gravity of 1·45, and, by this time, nearly all the carbonate of soda and any ferrocyanide of sodium that may have been present have precipitated. After being allowed to settle, the liquor is drawn off and concentrated, to form solid caustic soda. The patent includes a process for the separation of the ferrocyanide of sodium from the carbonate of soda, and obtaining both salts free from admixture. I need not here describe the process for separating the ferrocyanide. There is also included an improved method for concentrating liquors by exposing them in thin films to the action of heated air.

I now proceed to describe the process as at present generally employed for the production of solid caustic soda without the use of lime, *i. e.* from the red liquor.

Manufacture of Caustic Soda from Red Liquor.—The liquors obtained by lixiviating black ash are concentrated by any of the methods usually employed, until the greater portion of the carbonate of soda has separated. The mother-liquors thus obtained are the red liquors; they have a sp. gr. of about 1·30, and contain principally hydrate of soda; besides this, however, there exists in them some quantity of carbonate of soda, a deep red compound of sulphide

of sodium and sulphide of iron, some sulphate of soda and chloride of sodium, a small amount of ferrocyanide of sodium, and a minute quantity of some other compounds. These red liquors are mixed with a small quantity of chloride of lime, and placed in a pan generally known by the name of a *fishing* or *boat pan* so called from its shape. In some works the bleaching powder is not added quite so early in the process.

This pan is made of quarter-inch wrought iron plates riveted together. It has a length of about 30 ft. and a width of about 8 ft.; the sides are sloping, so as to facilitate the collection of salts; but the greatest depth does not exceed 2 ft. 6 in. The pan is set in brickwork and heated by a fire underneath it, the flues from the fireplace passing directly under the entire length of the sloping sides of the pan. There are several methods of setting these boat-pans, and in the arrangement of the fireplace and flues, nearly every works having a distinct plan of its own.

The invention of this pan, which is largely adopted in alkali manufactories, is due to Mr. David Gamble, of St. Helen's. In this pan the liquor is concentrated by boiling until it has a specific gravity of 1·40, and a temperature of from 260° to 270° Fahr. Some nitrate of soda is added to the liquor whilst in this pan. During the concentration, salts separate which are fished out by means of a perforated spade. When the liquor has obtained the sp. gr. and temperature I have mentioned, it is run out into a vessel called the cooler or settler, and there allowed to remain some little time in order that salts may deposit; by cooling, the liquor deposits salts which at a high temperature are held in solution. Some manufacturers allow the liquors to settle some time in the boat-pan, but this I consider to be a bad plan, as the pan may then be said to be doing no work; but if the liquors are at once run off when sufficiently strong, the pan may again be filled up, and the boiling of other liquors commence.

The boat-pans very frequently require repairs, which is a serious annoyance to the manufacturer. The principal reason for this is, that the salts sometimes adhere to the sides of the pan, notwithstanding the most careful attention on the part of the workman. Where the salts thus adhere, the pan becomes much hotter in that part, and presently when the liquor penetrates through this crust of salts the pan is suddenly cooled, and the unequal expansion and contraction of the plates injures it severely. This is not the only reason, for the caustic soda liquors appear to act upon the iron of the pan, and thus injure it, especially where the plates are riveted together. I shall allude to this action of the liquors upon iron again presently.

The salts which fall in the boat-pan and settler consist principally of carbonate of soda, mixed with some sulphate of soda, and also with a small quantity of chloride and ferrocyanide of sodium. They are sometimes converted into soda-ash, but more frequently are dissolved, the carbonate converted into caustic soda by means of lime, and then added to the red liquors. The liquor, when properly settled, is run out into another vessel. This vessel is a hemispherical cast-iron pot, which at the top has a diameter of about 5 ft.; to the top of the pot is fitted a cast-iron ring, which is about $2\frac{1}{2}$ feet high; and the greatest depth of the vessel, including the ring, is from 5 ft. to 5 ft. 6 in. It is set in brickwork, and heated either by a fire underneath it which plays directly upon the rounded bottom of the pot, or it is heated by the waste heat from another pot of the same description which is used in the finishing process.

To the liquor in this pot more nitrate of soda is added, and the whole boiled together for some time (from twelve to twenty-four hours, according to circumstances); more salts separate which are fished out by the workmen; the liquor is also allowed to settle some time.

When salts cease to fall, the liquor is placed in another pot called the finisher

or finishing-pot, which is similar to the one last described, but is always heated by its own fire. In this pot the liquor is boiled until it contains upwards of 60° of soda. More nitre is thrown into this pot. During the boiling a thick scum appears upon the surface of the liquor, which is carefully skimmed off by the workman; and when the contents of the pot possess the desired percentage of soda, the fire is slackened or entirely withdrawn, and the liquor after being allowed to settle a short time is run off into iron casks, where, as it becomes cold it assumes the solid form, and is then ready for removal from the works.

The process for the manufacture of caustic soda from red liquor differs slightly in minor details in different works, but in all principal points it is conducted in the manner I have just described.

I have not in this short sketch alluded to the changes which the liquid undergoes, for I think it better to mention them after describing another process for the manufacture of caustic soda, which necessitates the use of lime.

Preparations of Caustic Soda from Black Ash and Soda-Ash.—In this process either black ash or soda-ash is used as the source of the soda. The liquors obtained by lixiviating black ash are diluted with water until they have a sp. gr. of from 1·09 to 1·12, or if soda-ash is used, it is dissolved in water until the solution has the specific gravity. The liquor is then agitated with lime, in order to convert the carbonate of soda into hydrate of soda:

$$NaO\ CO_2 + CaO\ HO = NaO\ HO + CaO\ CO_2.$$

If the specific gravity is higher than 1·10, the causticizing is not complete, as some carbonate of soda remains in the liquor. Even on a small scale in the laboratory this is the case; and it is decidedly preferable not to have the specific gravity of the liquor higher than 1·09.

The vessels in which the liquors and lime are agitated together are usually made of a portion of an ordinary cylindrical boiler. The boiler is generally cut in half lengthways. Fitted in this vessel is an agitator made of iron, and somewhat similar in form to the agitator of an ordinary butter-churn. When at work, it is kept revolving by means of steam power. The vessel is filled to a certain height with liquor, and milk of lime or caustic lime in lumps is then mixed with it, and the mixture agitated until the decomposition is complete. It is decidedly the best plan to use milk of lime rather than lump lime, as the process of agitating the mixture requires much less time. The milk of lime should be made in a separate vessel, and from it run into the causticizing pan. With milk of lime the decomposition may be completed in about half an hour; and the liquor is then run into large iron settlers, and there allowed to remain until all the lime-mud has deposited.

Treatment of Lime-Mud.—Before describing the process for concentrating the liquors, I will first dispose of this lime-mud. After the liquor has been run off, the mud is washed, in order to free it as much as possible from any soda which may be mixed with it.

This washing is effected in two or three ways. One method is to agitate it with water in a vessel similar to the causticizing pan, or else to agitate it by manual labour with a wooden pole or iron plunger. When the lime and water have been sufficiently agitated together, the mixture is allowed to stand, so that the lime-mud may settle to the bottom of the vessel. This settling may either take place in the washing vessel or in a settler set apart for the purpose. The clear liquor or washing, which contains any soda that may have been dissolved, is run off and used either for dissolving more soda ash or for diluting fresh black-ash liquor, as the case may be. The lime-mud is run out of the settler into a heap to dry.

Another method employed is to run the mixture of lime-mud and washings on to a filter. The filter is a large iron vessel fitted with a perforated false

bottom. Upon this false bottom is placed first of all a layer of coke, above this a layer of pebbles, and on this again a layer of sand.

The washings are either allowed to drain slowly through the filter, or the process is hastened by producing a vacuum by connecting the lower part of the filter with a large air-pump, and then exhausting the air, or by injecting steam into the space at the bottom.

By producing a vacuum, the liquid is caused to pass through immediately. When all the liquid has passed through, fresh water is run on to the lime, and percolating through it washes out more of the soda; and this process is repeated until the mud is sufficiently free from soda. The lime is then thrown into a heap to dry; a tolerably warm place (such as a slip of ground immediately over a flue) being selected for the drying place.

The lime-mud, when sufficiently dry, is used instead of limestone in the manufacture of black ash.

Composition of the Lime Deposit.—By the most careful washing it has not, I believe, been found practicable to entirely free the lime from soda. Although the last washings passing away from it may not contain any soda whatever, yet, if the washed lime is subjected to a dull red heat sufficient to expel the carbonic acid, and the mud then washed with water, more soda may be extracted. Mr. Kynaston, formerly a pupil of Dr. Muspratt, and afterwards chemist at the works of Messrs. Muspratt, Brothers, and Huntley, of Flint, was I think the first to notice this, and he supposes that the soda is chemically combined with the lime. This is, I know, the opinion of several chemists who have had to deal with the subject, and I certainly believe it to be so myself. Mr. Kynaston states that from five to six per cent. of soda remains after washing the undried mud. I have not found the amount quite so great. When the washing has been carefully performed on a small scale in the laboratory, I have never found more than 3 per cent. or less than 2½ per cent.

This soda is of course found in the lime-mud produced by the soap-makers, and many of them send it away as refuse, or sell it at a very low price to persons who use it for mortar. By so doing they are losing a large quantity of soda. A year or two ago I examined some of this refuse from a soap-works, and found it to contain 5½ per cent. of soda; but this had been carelessly washed.

Dr. Muspratt, in his 'Dictionary of Chemistry,' suggests that the soap-manufacturer should first dry this lime deposit by exposure to the air, and then heat it, to expel carbonic acid. The lime, being thus converted into the caustic state, may be used to prepare fresh lye, and the soda which it contains would be thus saved. This process may be repeated until the lime becomes too highly charged with the impurities of the soda-ash.

This suggestion is worthy the attention of the caustic soda makers, who may perhaps find it an advantage to use the same lime for causticizing several quantities of liquor.

Concentration of Causticized Liquors.—I must now go back to the causticized liquor which I left in the settlers. This liquor is now to be concentrated. In some works (indeed, as far as I know, the practice is general) it is first placed in an iron boiler (an ordinary steam boiler), which may be closed in and fitted with safety-valves, pipes, etc., or an opening left for the escape of steam. In the former case the steam disengaged may be used as a motive power for working the machinery required in the works.

A patent has been taken out by Messrs. Roberts, Dale, and Co., of Warrington and Manchester, for the concentration of liquors in this manner and the employment of the steam disengaged.

The liquor is concentrated in the boiler until it has a specific gravity of 1·24 or 1·25 and a temperature of 230° Fahr. It is then run into the boat-pan,

and from that time the process is conducted in the same manner I have described when speaking of the red-liquor caustic, except that in some instances the second concentrating vessel is not used, but the liquor is run from the boat-pan into the cooler, or settler, and from that direct into the finishing-pot. When however soda-ash is employed, it is not necessary to give so large an amount of settling, or to add any nitrate of soda, except in occasional instances.

Chemistry of the Process.—I will now describe the chemical changes which take place during the concentration. As I before mentioned, the red liquor contains hydrate of soda, carbonate of soda, sulphate of soda, chloride of sodium, sulphides of sodium and iron, together with some ferrocyanide of sodium and a small quantity of other compounds. The causticized black-ash liquor also contains the same compounds. Both the red liquor and the causticized black-ash liquor, as they become stronger by boiling in the boat-pan, deposit salts, which consist principally of carbonate of soda, some sulphate of soda, and a little ferrocyanide of sodium. When nitre is added to the liquor some of the sulphide of sodium is oxidized, and the sulphide of iron being at the same time converted into peroxide is precipitated with the salts, giving them a deep red colour. It is not well to add the nitre too soon in the boat-pan, as when it is added early, before the temperature is sufficiently high, some of it instead of being decomposed is deposited with the salts.

The oxidation of the sulphide proceeds slowly in the boat-pan, the sulphide being converted into sulphate and the nitrate into nitrite of soda. This is when the temperature is under 280° Fahr., and as a rule the liquor in the boat-pan never reaches a higher temperature than 270° Fahr.; but when, as is the case in the next vessel, the temperature is above 280° Fahr. or 290° Fahr., the decomposition proceeds much more rapidly, and ammonia is disengaged to a very large extent. Although some of this ammonia is without doubt derived from the decomposition of the cyanides, yet the quantity is so very great that the amount of cyanides present could not produce it all. It proceeds from the decomposition of the nitrate of soda; and, according to Dr. Pauli, of St. Helen's, who has given much attention to the subject, the change may be thus represented:—

$$2\,NaS + NaO\,NO_5 + 4\,HO = 2\,NaO\,SO_3 + NaO\,HO + NH_3$$

When the temperature rises above 310° Fahr., as it does in the finishing-pot, free nitrogen is also given off. This decomposition is explained by Dr. Pauli thus:—

$$5\,NaS + 4\,NaO\,NO_5 + 4\,HO = 5\,NaO\,SO_3 + 4\,N.$$

This I believe to be a true explanation of the principal decompositions which take place; but it must be remembered that there are other compounds present, such as sulphites, hyposulphites, etc., and these also are decomposed. Dr. Muspratt represents the decomposition:—

$$2\,NaS + NaO\,S_2\,O_2 + NaO\,NO_5 + 4\,HO = 4\,NaO\,SO_2 + NH_4\,O.$$

$$\text{or } NaS + NaO\,S_2\,O_2 + NaO\,SO_2 + NaO\,NO_5 + 4\,HO = 4\,NaO\,SO_3 + NH_4O.$$

The quantity of sulphide of sodium present in the liquor is, however, in greater proportion to the sulphites and hyposulphites than is represented in the equation; and there can be no doubt that hydrate of soda is also formed during the decomposition. It is rather a difficult matter to say with certainty what decomposition really does take place when there are so many compounds present. Probably the changes as represented both by Dr. Muspratt and Dr. Pauli take place, and others most likely also occur; but the explanation given by Dr. Pauli appears to me to represent the principal decomposition.

The iron also present in different forms is oxidized into peroxide, and unless

separated would give the soda a very objectionable colour. Its separation is principally effected by settling in the pans and settlers. As the liquor becomes more dense the iron does not settle down readily, and is found to rise to the top of the liquid in the finishing-pot as a scum, which is skimmed off by the workman; and the caustic soda, when properly made, is almost white and comparatively free from iron. It however still contains some, which is sure to be the case, owing to the fact that peroxide of iron is soluble in caustic soda to a slight extent; although it is generally stated in chemical books that soda *completely* precipitates persalts of iron. By digesting precipitated peroxide of iron with solution of caustic soda, I have found the peroxide to be taken up in greater or less proportion according as the solution was stronger or weaker. When however the solutions were diluted with water, some of the peroxide was again precipitated, but there still remained dissolved permanently, even when the solution was extremely dilute, a small quantity of iron, equal to one part of peroxide to 7000 parts of soda.

There is more than this in much of the caustic soda of commerce, which is owing to the fact just mentioned, that a concentrated solution of caustic soda takes up a larger quantity in proportion of peroxide of iron than is taken up by more dilute solutions.

I am inclined to believe that some of this is merely mechanically held, owing to the oxide being in a very finely divided state, and therefore very light; and the soda solutions being very dense, the oxide does not readily precipitate. As I mentioned just now, if the strong solution of soda is diluted with water some of the peroxide is precipitated, and a similar result takes place when some of the caustic soda of commerce is dissolved in water. It may be that a strong solution of soda *dissolves* more peroxide of iron in proportion than a weaker solution, and that upon dilution the peroxide is precipitated, but I doubt it; for I have found that when concentrated caustic soda liquor, to all appearances clear and bright, is placed in a stoppered vessel and allowed to stand for several days, the quantity of iron in it gradually decreases, and the bottom of the vessel becomes covered with a deposit of peroxide of iron. This appears to show that the iron is merely mechanically held in a very finely divided state, and by prolonged settling was deposited.

It has been suggested that the peroxide of iron during the boiling of the caustic liquor with nitre at a high temperature is by oxidation converted into ferric acid, and this uniting with soda forms ferrate of soda. At one time I was much disposed to doubt this, but lately I have made some experiments upon this point, and the results I have obtained lead me to believe that ferrate of soda is formed and does exist in solid caustic soda, but is decomposed upon dissolving it in water.

Some of the caustic soda sold has a very delicate blue or greenish tinge, which is, I believe, due to the presence of a trace of manganese.*

The quantity of nitre used varies considerably. For red-liquor caustic, from 3 quarters to $1\frac{1}{2}$ cwts. is used per ton of caustic; for caustic soda made from black-ash liquor, about $\frac{1}{2}$ cwt. per ton is employed; and when soda-ash is used it is seldom necessary to add any.

The consumers of solid caustic soda have a great objection to the presence of iron in it, and it is very desirable that it should be separated. Now,

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* Mr. Martin Murphy, assistant to Dr. Muspratt, states, that he has proved this colour to be due to manganese, and supposes the manganese to be derived from the limestone used in making the black ash. He has found manganese in several samples of limestone which he has examined.

without doubt, this should be done as early as possible, and before the liquors become strong; and if the iron can be separated, not in the state of oxide, so much the better. I am not aware that this is done. It may, however, be effected by the employment of Mr. Gossage's oxidizing tower. If the black-ash liquors, or even the red liquors, are subjected to the action of air in Mr. Gossage's tower, the sulphide of sodium is converted into sulphate or sulphite, and the sulphide of iron is precipitated. It therefore follows, that if the liquors are properly settled, all the iron which existed as sulphide may thus be separated at the very commencement of the process (a great saving of nitrate of soda would also be effected).* There still, however, remains some iron in the form of ferrocyanide of sodium, and all this does not separate as salts, but the iron of the ferro-cyanide is converted into peroxide of iron, which either remains dissolved by the soda or separates as a precipitate. There is also the oxide of iron (in the shape of rust) which the soda takes up from the vessels used in the manufacture, and, unless I am mistaken, the concentrated soda liquors act upon metallic iron. By exposing a piece of good wrought iron to the action of the liquor in the finishing pot for two or three days, I found it to materially lessen in weight. I had not time to carry out the experiment in a complete manner, so as to satisfy myself upon the point. There are so many compounds present in the liquors that the action upon iron may not be due to hydrate of soda, but probably to other compounds. The iron is, however, only acted upon but very slowly. I have no doubt means will soon be adopted to free the caustic soda from the small quantity of iron it now contains, for several persons are working at the subject, and I am informed that already some samples have been produced which are very nearly chemically pure.

The 'Chemical News,' of June 28, 1862, contains an article by Dr. P. Pauli, of the Union Alkali Works, St. Helen's, upon "The Preparation of Pure Caustic Soda on a Large Scale," and the process there described will, I believe, meet the difficulty which is at present experienced in preparing caustic soda free from iron, etc. The following is Dr. Pauli's description of the process:—"Three tons of commercial caustic soda, containing excess of water, alumina, and all the impurities which commonly occur in this substance, are fused in a cast-iron pot. During the evaporation, nearly all the carbonate and by far the larger quantity of the other salts separate out on the surface as a scum, and can be easily removed. The liquid mass is then heated to dull redness, and kept at that temperature during the night. In the morning the mass appears perfectly transparent, the sides and bottom of the vessel being coated with cauliflower-shaped masses of crystals, consisting of silicate of alumina, with chloride and sulphate of sodium, and a little lime. The clear fused liquor is ladled off from these crystals, and when cooled is ready for use."

Dr. Pauli remarks, that the soda thus obtained contains only a trace of carbonate of sodium, is perfectly free from alumina, and that oxide of iron is completely separated from it; also that it is hard and brittle, and may be easily obtained as a fine powder by attrition in an iron mortar.

A few experiments I have made since reading Dr. Pauli's paper fully corroborate the statements therein contained.

Use of Chloride of Lime.—Before going any further, I would make a few observations respecting the use of chloride of lime. Its use should be avoided, for, although it effects the object desired,—the oxidation of some of the sulphur compounds,—yet the advantage is more than counterbalanced by the loss of alkali it occasions by converting it into chloride of sodium. It is decidedly preferable to use nitrate of soda instead of chloride of lime, although

* I am informed that this process has lately been adopted in an extensive Lancashire works.

the price of the former is much higher than that of the latter; but I have found by experiment that nitrate of soda is in the end the cheapest, as by its decomposition hydrate of soda is formed, whilst by the employment of chloride of lime some alkali is rendered useless. The results of some practical experiments which I have just completed, show that 100 parts of chloride of lime render useless about 50 parts of alkali.

Other Processes for Manufacturing Caustic Soda.—There are two or three other processes which I will just mention before concluding.

One, formerly employed, consisted in intimately mixing together one part of common salt and from four to six parts of litharge and a little water. Chloride of lead and hydrate of soda were formed. The chloride of lead afterwards combined with some of the undecomposed litharge to produce oxychloride of lead, which, being insoluble, was allowed to deposit, and the clear liquor containing the hydrate of soda was run off and evaporated. The lead compound, when dried and fused, formed the colour known as patent yellow. This process has, I believe, been abandoned on the score of expense. With the large production of caustic soda of the present time there would also probably be a difficulty in making use of the yellow pigment. Another process which has been proposed, was to mix together solutions of hydrate of baryta and sulphate of soda. The insoluble sulphate of baryta is formed and precipitates, and hydrate of soda remains in solution. Caustic baryta cannot, however, be procured in anything like the quantity required for the carrying out of this process on a large scale.

Mr. Hunt proposed to decompose sulphate of soda by roasting it with coal or coke, and then lixiviate the mass with water. The solution contains sulphide and bisulphide of sodium, and carbonate and sulphate of soda, and is boiled with oxide of zinc or black oxide of copper. By the action of the oxide upon the sulphides of sodium, sulphide of zinc or copper is produced, which precipitates, whilst hydrate of soda remains in solution.

A process mentioned in 'Silliman's Journal' for November, 1858, consists in first causticizing black-ash liquors with lime. The caustic solution is then evaporated, to separate salts, and fine sesquioxide of iron (in the form of Venetian red or pure earthy hæmatite) added to it in such a quantity, that the sesquioxide shall somewhat exceed in weight the amount of dry hydrate of soda contained in the liquor. This mixture is dried down with constant stirring, and roasted at a dull red heat. The roasted mass is then treated with water so as to get a solution of sp. gr. 1·40. The clear solution is poured off and evaporated. I am not aware that this process has been adopted anywhere in this country.

In the 'Chemical News,' of May 10, 1862, is a notice of a paper by W. Woehler, in the 'Annalen der Chemie der Pharmacie,' on "The Preparation of Caustic Soda." This process consists simply in calcining nitrate of soda with peroxide of manganese. No chameleon is formed as might be supposed, since the nitrate decomposes long before the mixture can reach the temperature necessary for the production of manganic acid. This process appears to me to be too expensive to be used for the preparation of caustic soda on a large scale.

A word or two respecting the mode of using the black-ash liquors for the production of solid caustic soda. The black-ash liquors contain both hydrate of soda and carbonate of soda, the quantity of soda as hydrate existing generally in the proportion of about 25 parts to every 75 parts of soda as carbonate. Now, if the carbonate of soda is at once converted into caustic soda by the addition of lime, it is necessary, as the black-ash liquor has on the average a specific gravity of 1·25 or 1·26, to add water to the whole of the liquor to reduce it to a sp. gr. of 1·10, and by so doing the caustic portion is diluted as

well as the carbonate. In order to produce solid caustic soda, this water must again be expelled. It appears to me to be a better plan to first concentrate the black-ash liquors, so as to separate all the carbonate as salts. This may then be redissolved in water, causticized, and then evaporated with the other caustic liquor (the red liquor).

I am of opinion that the process for the manufacture of caustic soda, as the consumption of that article increases, must be conducted something after the manner of the process described in the patent of Mr. Gossage, which I mentioned at the commencement of this paper; but, instead of using the salts obtained for the production of soda-ash, they will be redissolved, causticized, added to the red liquors, and the mixed liquors concentrated to produce solid caustic soda.

In a few words I will give an outline of what the process would then consist of.

Oxidize black-ash liquor in the oxidizing tower, and allow the sulphide of iron to deposit; concentrate the liquors until all carbonate has separated; redissolve this carbonate and causticize; add the causticized liquor to the red liquor and evaporate, adding as much nitrate of soda as is required.

I have now described the manufacture of solid caustic soda. I might perhaps have given a more minute description of the various processes and of the apparatus employed, but such details are only interesting to those actually engaged in the manufacture, and therefore I consider it unnecessary to enter into them here. What I have described embraces all the principal points in the manufacture.

In conclusion, I would remark that the production of solid caustic soda is one of the many advantages which have been derived from bringing science to bear upon the practical working of our manufacturing operations.

Of all the sciences, chemistry has without doubt contributed the most to promote the growth and development of the arts and manufactures; and one of the greatest examples of the importance of chemistry in its practical applications is the rise and development of the soda manufacture.

As Liebig justly remarks,* "The manufacture of soda from common culinary salt may be regarded as the foundation of the extraordinary impulse given to improvement in every department of modern industry; and we may take it as affording an excellent illustration of the dependence of the various branches of human industry and commerce upon each other, and their relation to chemistry."

Laboratory, 79A, *Lord St., Liverpool.*

ON THE WEIGHTS, MEASURES, ETC., OF THE NEW PHARMACOPŒIA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—I am glad to see the subject of weights to be used in the New Pharmacopœia is again engaging attention. Not having expressed an opinion in this important matter, I am induced to make a few observations; if you think them worthy of place in the Journal, they are at your service.

I may premise that in the compiling of the New Pharmacopœia, the application of old names to new preparations was a subject frequently adverted to, and the evils of so doing carefully pointed out. If this be true with respect to articles to be weighed, it is no less true as regards weights to be used,

* 'Letters on Chemistry,' page 267.

and much confusion and many mistakes may occur unless this be carefully avoided.

Two systems have been brought forward to the framers of the Pharmacopœia: the metrical, and that of Dr. Wilson. The latter seems to have gained much favour, and is recommended as that worthy of adoption. Grave objections exist against it; and the London College of Physicians have gone so far as to pass a minute, condemning the alteration in the value of the grain, that will occur in carrying out this system.

The plan the late Dr. Wilson proposed was the adoption of the avoirdupois pound and its division into 16 ounces, as at present. These ounces to be divided into 8 drachms, each of which to consist of three scruples, and each scruple 20 grains. The present grain would be thus reduced from 1·00 to 0·911458333.*

The advantages from this change he stated as:—

1st. Of relieving the dispenser from using two descriptions of weights.

2nd. He would buy and sell by the same weight.

3rd. That "the grain for solids would be also equal to the computational weight of the grain, or its representative the minim, in the liquid measure, from which it formerly differed; and this correspondence between weight and measure would be carried upwards through all the multiples of either—the ponderable value of any measured quantity of a fluid, in relation to distilled water, being easily ascertainable by multiplying the ounce by the specific gravity." (See his paper, 'Pharm. Journal,' July 1, 1859.)

He anticipated the opposition to the reduction in weight of the grain, and goes on to say, "To those who have a repugnance to an innovation, it may be some additional satisfaction to reflect, that possibly already in the reign of Henry III., but certainly in that of Edward I., the statute pound of England was divided like that now suggested, into 7680 grains," etc.

"The classical scholar will have a similar gratification in remembering, that the avoirdupois ounce, as now proposed for medicine, is considered to be as nearly identical as possible with the Roman *uncia;* and that the new, or, in this case, the revived grain and scruple would thus, along with the drachm, assume the same close relation to those inherited from antiquity and employed by Galen," etc. He goes on to remark that this change would bring it nearer to that of all other systems of medicinal weights at present employed; but to this I may briefly remark, that I am informed the weights and measures are at present occupying the attention of the compilers of the French codex, so as that they are not altogether satisfied with their standard, and that an approximation of ours to theirs to-day, may at no distant period be departed from, and that approximation must be exceeding near, which would render no calculation necessary.

The advantages here pointed out by the division of the pound avoirdupois, might, it strikes me, be equally attained without the inconvenience, the confusion, and, I may add, the danger, that would occur by the division of the pound into 7680 grains, and the application of the names *drachms, scruples,* and *grains* to weights $\frac{1}{11}$ below the weights of those now in use; by adhering to the present division of 7000 grains troy, rejecting the terms *ounce, drachm,* and *scruple,* and adopting the 1000 grain and other weights, as suggested by Dr. Paget. (See p. 48 of the present vol.)

If the *uncia* has its claim for antiquity, we may claim no less for the grain, which has been used from time immemorial in the preparation and dispensing of medicine; while quantities may be easily and definitely expressed without requiring new names, by tens, hundreds, thousands, etc. Old family receipts

* Dr. Wilson said 0·91, but this makes the pound 11·2 grains short of its real weight.

could be dispensed carefully by the new as well as by the old weights (drachms, scruples, etc.). With this weight, measures could be easily assimilated, since the present gallon is 70,000 grains, or 10 pounds avoirdupois. The seventh part of a solid or fluid pound being 1000 grains, the fluid grain would represent the minim or drop, which has occasioned such perplexity, and a minute might be inserted to that effect in the new Pharmacopœia; while the strength of the compounds being altered, no confusion could occur. (With regard to old receipts, the old minim would be required, but calculations might be made.)

Scientific investigations and results are calculated and stated by the hundred or thousand parts. If this plan were adopted in the formulas of the new Pharmacopœia, they could be readily compounded with accuracy by any decimal system that might be agreed on hereafter, whatever its unit.

This would in fact be a decimal system up to 1000 grains, and, if it be approved of, might be extended. The introduction of a 10,000-grain weight (a Baros) might be adopted in lieu of the present pound, with a corresponding measure (a Metron).

At present, the term pint is applied to three different measures, the old wine pint being 12 oz., the old apothecaries' pint 16 oz., and the imperial pint 20 oz. The latter is the pint that ought to be employed according to the existing Pharmacopœias; but in making up old recipes, we are in many cases doubtful which measure ought to be employed. Many physicians even ordered the octarius (℥xx pint) when they intended the 16 oz. pint, to which they were accustomed in their youth, long after the publication of the Pharmacopœia, 1836; and, indeed, we can hardly expect aged men in active practice to burden their memories with these changes. Similar perplexities will occur with weights, if the terms, drachm, scruple, and grain be retained and the value depreciated, but to a much greater extent, to an extent which only the dispenser can anticipate, but of which an idea may be formed by an inspection of the following tabular statement:—

Present avoirdupois drachm	27·34 grains (troy).
Troy drachm in use	60 grains.
Proposed drachm	60, but in reality 54·68 grains.
Present drachm, Dublin College	54·68 grains.
Scruple in use L. and Ed.	20 grains.
,, ,, D.	18·22 grains.
Scruple proposed in reality	18·229 grains, to be divided into 20 *new* grains.

Table of Weights and Measures.

10 pounds avoirdupois,		70,000 grains, 1 gallon imperial.
1 ,,	,,	7,000 grains, 7,000 fl. grains.
⅐ pound	,,	1,000 grains, 1,000 fl. grains.

To find the weight of any given measure of a liquid, multiply the weight it will contain by the specific gravity. The weight of a gallon of any liquid in avoirdupois pounds and decimal parts, is at once seen from its density, merely removing the decimal point one place to the right; thus, a gallon of ether at ·750 weighs 7·50 (7½ lbs.). A gallon of nitric acid at 1·500 weighs 15 lbs. (Beasley.) A bottle or measure of 1000 grains would give on weighing the specific gravity without calculation (temp. 62° Fahr.).

In conclusion, I beg to make a few remarks on the Report of the Pharmacopœia Committee (page 608, last vol.). They wish all Pharmaceutic preparations in store, prepared according to present formulæ, to be destroyed or altered, and they further wish a statutory injunction to be passed to prevent Pharmaceutical chemists and others from using existing Pharmacopœias. This seems to be attempting too much. The dispenser ought always to endea-

vour to fulfil the intention of the prescriber, whatever preparation, old or new, he may prescribe ; and the introduction of the new Pharmacopœia must, of necessity, *temporarily* entail on the dispenser the keeping of many of the old preparations.

As no Act of Parliament can be obtained this year, and we have been long and anxiously looking for the new Pharmacopœia as an embodiment of much valuable information—much called for on account of the many remedies recently introduced, for which no recognized formulas exist, I trust we shall not long be deprived of it. No Act of Parliament, I should think, could prevent any practitioner from prescribing any particular preparation from any of the existing Pharmacopœias for which he has any partiality.

I have freely expressed my opinions, and, I trust, without giving offence. I hope the important subject of weights and measures will receive the deep consideration of all branches of the medical profession that it merits, and that the Pharmacopœia Committee may be induced to reconsider the matter, and recommend for adoption a system more in accordance with the advanced state of science than that which they have advocated.

In dispensing croton oil—as, for instance, where one fluid grain is directed to be mixed with a pill mass—I grant difficulty would occur; but this (and similar cases) could be provided for by the introduction of an oleo-saccharum crotonis, or pilula crotonis, etc., into the Pharmacopœia.

I fear I have exhausted your patience, and remain

Yours respectfully,

William Proctor.

Collingwood Street, Newcastle-on-Tyne, Aug. 14.

THE USE OF METHYLATED SPIRIT IN PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—There is one feature in the history of "cleaned" methylated spirit which deserves a brief notice. This is its use for dram-drinking. The procedure is somewhat roundabout for appearance' sake, but its success may be readily understood from the following description.

A cleaned methylated spirit with a little Sp. Æther. Nitr. is used for making a tincture of some innocent aromatics, as cloves, cassia, etc., and well coloured by cochineal. The spirit used need not be of great purity for this purpose, and a shrewd buyer will get what suits him for sixpence per pound in quantity. The name given to this compound is "Cordial Indian Brandee," an audacity which has for its counterpart the name of "Indian Gindee," given to another preparation.

This "Brandee" is supplied to all the hucksters' shops of any particular district, often forced upon them on "sale or return," and its labels recommend it for colds, colic, flatulence, etc. Of course the effects of a dose of the "Brandee" depend upon the spirit it contains, there being no active medicinal matter present.

It does not require much reflection to appreciate the probable success of a form of alcohol, competing with the old cordials and distilled spirits in price, being pleasant, and not even conveying the idea of medicine by its name.

In Yorkshire and Lancashire this success has been attained, and at least one maker of "Indian Brandee" buys a thousand gallons of Sp. Æther. Nitr. Dil. at once, for compounding this cordial.

No wonder that the spirit duties are falling off!

It is not my business to trace cleaned methylated spirit into the hands of

another class of traders, viz. the publicans ; but, having had pretty good opportunities of comparing notes with those best informed on the subject, I find a general belief that it is being so employed.

I have previously spoken of the difficulties that would have to be overcome in putting down the abuse. It is well that members of the Pharmaceutical Society should appreciate the greatest, viz. a sophism that has been started, "that the Council cannot interfere *because it is a trade question.*"

Some promoters of this idea are interested in the use of the spirit, but I shall be mistaken if it finds much support in the country. Will every member wishing to check the abuse write to or see at least one member of the Council, and state his opinion whether that body ought to take up the question?

His time saved from serving on juries would thus be well employed!

I am yours respectfully,

R. Reynolds.

13, *Briggate, Leeds, August*, 1862.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I am glad to find that at length some members of our body have had the courage to speak on the subject of Methylated Spirit. From the first introduction of this abomination into Pharmacy, I foresaw it would be a source of pollution and degradation. Is the profession of Pharmacy ever to be one of grovelling in the dust and resorting to dodges? Surely we have a nobler destination.

I have little doubt but a good deal of the Methylated Spirit that has been sent out has been put to illegitimate uses, and I think, for the protection of the revenue, and the stomachs of the Queen's subjects, its use should be restricted to manufacturing processes. The consumption at present is very large in the manufacture of, and the process of dyeing with, the aniline colours, and in all probability this consumption will considerably increase.

Trusting that something will be done to remove this evil from amongst us, is the hope of

Yours respectfully,

Thos. Rimmington.

Bradford, August 6, 1862.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Methylated spirit is fast becoming such a gigantic grievance to all honest and respectable chemists, that I am glad to see the subject of its use in Pharmacy occupying such prominent places in your July and August numbers ; and I certainly think the members of the Pharmaceutical Society especially owe Mr. Reynolds hearty thanks for commencing the campaign in earnest. If the question had been still confined to its original merits, viz. the propriety of using methylated spirit in medicine at all, it would be greatly simplified ; for then it would only be the old fight of *purity* versus *impurity, genuine preparations* versus *adulterated, medicines of the London Pharmacopœia* against *spurious things* made with *impure spirit* to sell cheaply. In that case, the public could have been challenged on the ground of value received, and upon *sanitary* grounds ; but now, when "cleaned" spirit is sold at 7*s.* per gallon (virtually pure), and preparations are made and sold to the public at half the usual price, by designing and unprincipled men, who choose to defraud the revenue and deal unjustly by their brother-tradesmen, the contro-

versy is removed into another domain. The question is, shall a class of men (and those notoriously the least honourable and least qualified for their occupation) be allowed to carry on with impunity a trade that openly violates the laws, and so seriously injure the honest and conscientious man who shrinks from and scorns to adopt the same tactics. Let us have one of two things: either abolish the duty on pure spirit, and so place all men on a level, or stop the manufacture of methylated spirit, and so stop the "cleaning" process. I am constantly hearing of tinctures being sold at twopence an ounce, and tinct. opii at threepence; in a few cases I have heard of three-halfpence an ounce, and constantly "paregoric and sweet nitre" at twopence an ounce.

Can any honest man who buys his spirit from a respectable distiller, giving from 20*s.* to 22*s.* per gallon, compete with these prices? And what have honest men done that they should be called upon either to starve or give up their truthfulness and good name to meet these abominable evasions? Temptations to deviate from the straight path in business are numerous enough, without having *more* created. Besides, are not all men who knowingly use "cleaned" spirit liable to prosecution as well as the man who makes it? Tinctures made with "cleaned" spirit are offered to chemists at eightpence a pound and upwards, and the spirit, as before stated, at 7*s.* per gallon; this, it will be seen, leaves the dishonest trader a better profit even on his low prices than the honest man gets on his higher prices; leaving out of consideration the fact that the public, seeing and knowing no difference in the articles (as but little often exists), draw comparisons unfavourable to the honest man, who by that at once loses his business and reputation for fair dealing. Let all upright men immediately speak out upon this subject, and do their very best to put a stop to this rascality. If they decline to do this, they must be content to lie under the imputation that will certainly be put upon them, that they themselves are tainted. Above all, let the Pharmaceutical Society be at once heard, and that emphatically. No half-measures. Our Society has great influence, let it now use it to right a grievous wrong—a wrong too by which our members suffer most severely, from two causes, the one, that being more highly educated they are more sensitive and conscientious in their modes of doing business, and the other, that they are bound to take the London Pharmacopœia as their guide in the preparation of all medicines therein contained. That the Council of the Society may be in no false position, I would suggest that they issue an order at once to all the members, stating the illegality of using "cleaned" spirit, and the danger to the public health by the use of methylated spirit, and request or order the members under no circumstances to use either—at all events, not in a fraudulent manner.

The College of Physicians have shown their disapproval of the use of methylated spirit; let the Pharmaceutical Society show their disapproval likewise, not only of sophistication and adulteration, but of downright fraud. That the excise authorities, seeing the enormous loss that must accrue to the revenue, should be so quiet is a mystery; usually they are keen enough to seize upon every farthing they can obtain fairly, and in some cases *unfairly*. How is it that they are so supine in this case? Is it true, as is said by some, that political influence is at work—that "Hats" play an important part in this methyl controversy? Whatever may be the cause, it is a grievous hardship to honest men, and a disgrace to the authorities that they do not interfere to stop it. I have nothing to say against the use of methylated spirit in the manufacture of the finer chemicals, but I question whether much good is obtained by it. To the general public, who buy these things in very small quantities, the difference in price is not perceptible; to the retailer, the *profit* would be as good whether the article be dear or cheap; and in the present days of competition I question whether the large manufacturers profit more

by the sale when made with methylated spirit than when made with pure spirit.

Therefore, on *all* grounds (honesty, legality, and profits), we are called upon to do our very best to crush this fast developing system, which seems hydra-headed, one form no sooner disappearing than another springs up in its place. It is useless simply to call upon honest men to discountenance the use of "cleaned spirit" (this they do already), because their numbers are so small as compared to the opposite ranks, that the profit from the latter would be always enough to keep the "cleaners" going.

No! we must insist upon the excise authorities stopping it; if not in their own interest, at least in the interest of common honesty and morality.

I am, Sir, yours respectfully,

T. W. Gissing.

Wakefield, Aug. 18, 1862.

Birmingham, 21st August, 1862.

Alfred Bird presents his compliments to the Editor of the 'Pharmaceutical Journal,' and sends him the following correspondence:—

"Birmingham, 22nd July, 1862.

"To the Honourable the Commissioners of Excise.

"Gentlemen,—Within a few days, I have seen a list of the 'Pharmacopœia Spirits and Tinctures,' all made with un-dutypaid methylated spirit; many of these preparations are now being commonly sold retail, though not by me. I shall feel much obliged if you will inform me if it is legal to make and sell the spirits and tinctures of the London Pharmacopœia, prepared with un-duty-paid methylated spirit, *with or without* the gum sandarach? Also, if it is legal to sell them, *is it necessary to take out a methylated spirit license, when the spirit would not be sold alone, but only be used in making of the Pharmacopœa Spirits and Tinctures.*

"I am, Gentlemen, yours most respectfully,

"Alfred Bird."

Reply.

"Inland Revenue Office,

"London, 29th July, 1862.

"Sir,—In reply to your inquiry of the 22nd instant,

"I am desired to acquaint you that the Board do not object to the manufacture and sale of any strictly Pharmaceutical preparation made with methylated spirit, so long as it appears that such preparations are used for medical purposes, and not made a cover for such spirit being used as a beverage. I am to add, that a license is NOT required for the sale of any medicinal preparations made with methylated spirit.

"I am, Sir, your obedient servant,

"Thomas Dobson, *Secretary.*

"*Mr. Alfred Bird.*"

THE NEW ACT EXEMPTING PHARMACEUTICAL CHEMISTS FROM SERVING ON JURIES, ETC.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Having been summoned to the Central Criminal Court, with two other members of the Society, to serve as jurors during the present sessions,

and having had considerable difficulty in availing ourselves of the exempting clause of "The Juries Act, 1862," principally, I believe, through the wanton obstructiveness of the presiding judge, it may be for the convenience of our brethren if I point out the necessity of strictly adhering to the letter of the law, when claiming exemption from juries, and what that letter is.

The Act of 1862 plainly states that all registered Pharmaceutical Chemists are exempt from serving on juries, etc. But the question will arise, as in our case, what is a registered Pharmaceutical Chemist? The judge may plead ignorance of the existence of any such person, and throw the onus of proof on the claimant for exemption. The only way to meet this difficulty is by citing the Act 15 & 16 Vict. cap. 56, wherein it is clearly shown what is a Pharmaceutical Chemist.

The judge, as in our case, may refuse to receive the testimony on oath of the claimant as evidence that he is a registered Pharmaceutical Chemist according to the meaning and intention of these Acts, and also may refuse to receive the Registrar's ordinary certificate to that effect, because it is not countersigned by the President or two members of the Council, in accordance with the provisions of the Pharmacy Act.

To obviate the trouble and delay which will arise when a Pharmaceutical Chemist has to substantiate his claim for exemption before these luminaries of the law, it is advisable to be armed beforehand with a certificate, signed and countersigned as above advised, which may be obtained from the Registrar on payment of one shilling.

In future all these annoyances can be avoided by every Pharmaceutical Chemist giving the parochial authorities notice to erase his name from the list of jurors, which such authorities are directed to prepare before the 1st of September in each year by "The Juries Act."

I am, Sir, your obedient servant,

Wm. Bastick.

GLYCEROLE OF TAR (TAR PLASMA).

BY HENRY B. BRADY.

A combination of glycerine and tar has been used recently in skin affections instead of the tar ointment of the Pharmacopœia. The advantages seem to be that the glycerine compound is more readily absorbed, and less difficult to remove by washing. I have not been able to find a formula for the preparation in question, neither can I learn that any published one exists, and would therefore propose the following, as yielding an unexceptionable product. The strength is the same as that of the Unguentum Picis Liquidum, P.L. Price's Glycerine, six oz. weight; Tar, six oz. weight; Powdered Starch, two drachms. Warm the glycerine, stir in the starch, add the tar, and raise the mixture rapidly to the boiling point. Strain through a cloth, if necessary, and stir whilst cooling. The mere mixture of glycerine and tar heated in a water-bath, gives on cooling a spongy mass, the pores of which are filled with glycerine; after standing some time, complete separation takes place. Tragacanth, acacia, soft soap, and many other things have been tried as substitutes for the starch, but none of them with so good result. Made according to the above formula, Glycerole of Tar is a dark brown mass, perfectly smooth, in consistence somewhat softer than the ointment.

Newcastle-on-Tyne, August 14th, 1862.

REPORT OF THE
RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS,
AND OF THE
APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

On the Detection of Aniline, and the Production of a Blue Substance from Aniline.—Some time back, Dr. Letheby described a delicate test for aniline, especially intended for use in toxicological inquiries, which consisted in electrolysing a solution of the sulphate of the alkaloid by means of a galvanic battery. If a single drop, or even half a drop, of a solution of one part of aniline in 1000 of dilute sulphuric acid (one of acid to seven of water), be placed on a clean piece of platinum foil, and touched with the negative pole of the battery (a single cell of Grove's arrangement) while the positive pole is in contact with the platinum, the liquid acquires a bluish, then a violet, and finally a pink colour. If the sulphatic solution of aniline is stronger, or the drop is concentrated on the platinum foil by evaporation, the colour is of a deeper blue, and by using $\frac{1}{100}$th of a grain of aniline with a drop of dilute sulphuric acid, consisting of equal parts of acid and water, the galvanic test gives a rich blue or purple-blue reaction of considerable intensity. The action of this test appears to depend upon the nascent oxygen which is liberated at the surface of the platinum; and Dr. Letheby has shown that the same reaction may be obtained by other means, as by the use of bichromate of potash, binoxide of lead or manganese, etc., but none are so delicate and certain as the electrolytic method.

More recently Dr. Letheby has, in a communication to the Chemical Society, described some experiments made by him for the purpose of isolating and examining the product of this action. He found that, operating with strong solutions of the alkaloid, he obtained, in place of the violet colour, a deep blue and sometimes greenish-blue powder deposited on the surface of the platinum. He therefore endeavoured to obtain a sufficient quantity of this substance for examination. For this purpose about two ounces of aniline were dissolved in dilute sulphuric acid, placed in a large beaker, and subjected to the electrolytic action of two sets of Grove's batteries (each six inches by four) arranged for intensity. A sheet of platinum six inches by four was placed in the aniline solution and brought into contact with the positive pole of the battery, a flat porous cell containing dilute sulphuric acid was also placed in the solution, and this was connected by a similar sheet of platinum with the negative pole of the battery. By this arrangement, the nascent hydrogen from the negative pole was kept apart from the aniline solution, so that the nascent oxygen from the positive pole might have free and undisturbed action on the aniline. Very soon, the positive sheet of platinum became covered with a thick layer of dirty bluish-green pigment. This was removed, and, after being well washed with water, was collected in a filter and dried. Its leading properties are as follows:—

It occurs in the form of a dirty bluish-black powder, which is insoluble in water, alcohol, ether, ammonia, etc. While it rests on the platinum, it acquires a brilliant blue colour by immersion in ammonia, but the blue pigment does not dissolve.

Concentrated sulphuric acid dissolves it, and forms a blue, a green, or a violet solution, according to the degree of concentration; and when the solution is diluted with water, a dirty emerald-green powder subsides. This is also made blue by concentrated ammonia, and blue or purple by concentrated sulphuric acid.

The blue pigment is partly decolorized by reducing agents, as lime and sulphate of iron; and in this condition it dissolves, and, like indigo, acquires a blue colour on exposure to the air.

The dry pigment is decomposed at a red heat, evolving water and sulphurous acid, and leaving a black cinder.

Dr. Letheby is still engaged, in conjunction with Mr. Fewtrell, in the investigation of this substance.

The colour-tests above referred to for aniline closely resemble the reactions of strychnia; the two alkaloids are however readily distinguished by the volatility of the aniline, and also by the circumstance that while strychnia requires concentrated sul-

phuric acid to produce the violet coloration, aniline is best detected with diluted acid. In toxicological inquiries the aniline would be separated from the suspected matter by distillation, and subsequent concentration and examination of the distillate, by which all chance of confounding it with strychnia would be avoided.

On the Action of Carbonate of Ammonia on Magnesian Salts.—Chemists have generally hitherto represented that carbonate of ammonia precipitates magnesian salts only very imperfectly, or not at all; and that salts of ammonia, when present in excess, entirely prevent the precipitation. Dr. Edward Divers has however recently presented a paper to the Chemical Society, in which he details a number of experiments tending to prove that this statement is incorrect, or at least requires considerable modification. The results of his investigation are as follows:—If dilute solutions of sulphate of magnesia, chloride of ammonium, and carbonate of ammonia be mixed, so as to have present excess of ammoniacal salt, especially of the carbonate, no immediate effect will follow; but by allowing the mixture to stand, formation of a granular crystalline precipitate will always take place. If the carbonate of ammonia is in large excess, this will occur in ten minutes or so; if the excess be less, longer time will be required. The precipitate which thus forms consists of the double carbonate of magnesia and ammonia, having the composition $MgO, NH_4O, 2\,CO_2+4\,HO$, and containing 15·87 per cent of magnesia.

When a solution of neutral carbonate of ammonia* is added to a solution of sulphate of magnesia, simple carbonate of magnesia is precipitated, unless four equivalents of carbonate of ammonia are employed to one of magnesian salt.

When four equivalents and upwards of carbonate of ammonia are used, a semi-opaque crystalline deposit, consisting of the double carbonate, begins to form after some minutes, and rapidly increases, until ultimately nearly the whole of the magnesia is removed from the solution.

If two equivalents of neutral carbonate of ammonia are added to one equivalent of sulphate of magnesia, nearly one equivalent of chloride of ammonium must be present in order to prevent the formation of simple carbonate of magnesia.

If one equivalent and upwards of chloride of ammonium be present with one equivalent of sulphate of magnesia, formation of the double carbonate of magnesia and ammonia will always take place, no matter in what proportion the carbonate of ammonia be added; if four equivalents be used, the precipitation will be almost complete, and after twenty-four hours, phosphate of soda will yield but a mere trace of precipitate with the mother liquor; if two equivalents be employed, precipitation will occur in about a quarter of an hour; if less than two equivalents are taken, precipitation may not take place till next day, but it will appear, even if only a trace of carbonate has been added.

The result in these cases will not be affected by the strength of the magnesian solution; one part of magnesia in 5000 of water will be precipitated on the addition of sal ammoniac and an excess of carbonate of ammonia. The formation of the double carbonate in fact appears to depend principally on the amount of carbonate of ammonia present; if this is large, precipitation will readily and quickly occur even from very dilute solutions of magnesia.

If the precipitated double carbonate of magnesia and ammonia be added to pure water in small quantities at a time, it will dissolve to a considerable extent, and the solution may be kept for some time unchanged; ultimately, however, the compound decomposes into the separate carbonates. If the double carbonate be treated with a small quantity of water, so that the salt is in excess, then the water rapidly dissolves out the carbonate of ammonia, leaving the carbonate of magnesia in a compact crystalline mass.

The double carbonate dissolves sufficiently in solution of chloride of ammonium, to afterwards yield an immediate though slight precipitate with phosphate of soda. Carbonate of ammonia causes a precipitate in the solution after standing a few minutes. In solution of carbonate of ammonia the double salt appears almost insoluble.

Dr. Divers draws the following conclusions from his experiments:—

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* Prepared by adding caustic ammonia to the commercial carbonate in proper proportion.

"1. That, contrary to general statements, carbonate of ammonium *does* precipitate magnesian salts in presence of excess of ammoniacal salts."

"2. That the precipitate then formed is the double carbonate of magnesium and ammonium."

"3. That this salt is soluble to some extent in water, but very slightly so in solutions of chloride and sulphate of ammonium, almost totally insoluble in that of carbonate of ammonium; and that, within certain wide limits, the double salt is less soluble, according to the strength of the liquid, in salts of ammonium, particularly the carbonate."

"Besides the analytical bearings of these results, they are also of interest as furnishing us with a cheap and ready mode of preparing the double carbonate of magnesium and ammonium, which it is believed will be particularly useful in medicine; it also readily yields a useful carbonate of magnesium, either by the action of water or by a heat not greater than 100° C. This precipitation of the double carbonate may possibly supply the manufacturer with a mode of separating magnesia from its solutions."

On the Preparation of Selenium.—M. Phipson has been engaged in the analysis of the arsenical sulphur from the volcanic fissures (solfataras) of Naples. This body is of an orange colour, and only partially soluble in bisulphide of carbon. It differs therefore from the Sicilian crystallized sulphur, which is entirely soluble in that menstruum. It contains selenium and arsenic; the latter in large quantity. The analysis of an average specimen gave the following results:—

Sulphur	87·600
Arsenic	11·162
Selenium	0·264
	99·026

or expressed otherwise as—

Sulphur	80·458
Sulphide of Arsenic ($As S_3$)	18·304
Selenium	0·264
	99·026

It volatilizes completely by heat, with the exception of a trace of siliceous matter. Of the 87·6 per cent. of sulphur contained in this substance, 64·26 dissolve easily in aqua regia, but the remaining 23·34 parts will not dissolve even when boiled in the strong acids for several hours.

To prepare selenium from this sulphur, M. Phipson recommends the following process:—Digest the sulphur in aqua regia, dilute the solution and filter to remove the insoluble sulphur. Add to the liquid some crystals of sulphite of soda, until it acquires a strong odour of sulphurous acid; then allow the solution to stand for forty-eight hours, when the whole of the selenium will be found precipitated in the form of a rose-red powder. From 0·3 to 0·4 per cent. will be so obtained. Operating by the dry way with carbonate of soda and nitre, the whole of the selenium is not obtained.

New Process for the Manufacture of Vermilion.—M. Gautier Bouchard has published the following method for the preparation of vermilion:—200 grammes of flowers of sulphur, 400 cub. cent. of hydrosulphate of ammonia of 1034 sp. gr., and 1000 grammes of mercury, are introduced into a stone bottle of about one litre and a half capacity. The vessel is securely corked, and the mixture well shaken for about seven hours; after which it is allowed to stand for three or four days, the temperature being maintained at between 50° and 60° Cent. At the end of this time, or even before, the mixture assumes the appearance of a fine red magma. The vessel is uncorked and warm water introduced to dilute the contents. The vermilion which settles down is then washed with warm water until all traces of sulphide of ammonium are removed; it is then levigated and dried. Sometimes it is beneficial to treat the vermilion thus produced with nitric acid, and again wash it according to the method of Fuchs: this treatment, which is not essential, appears to fix the colour.

ON THE FUCUS VESICULOSUS, *LINN.*, (SEA-OAK, SEA-LETTUCE,) AND ITS USE IN OBESITY.

Subjoined is the mode in which this substance is employed by M. Duchesne-Duparc, who was the first to extol it as a means of counteracting obesity. He says:—

A decoction of the *Fucus vesiculosus* is prepared, which has a pungent and marshy taste. This is taken by some persons without reluctance, but more generally the reverse is the case. It may be taken between or during meals.

I prescribe the Fucus generally in the form of pills. My first experiments were made with the powder; but for more than a year I have thought it better to substitute the hydro-alcoholic extract, from which I obtain more rapid and regular results. Each pill hitherto employed by me has contained 0·05* of the extract; but the quantity may, without inconvenience, be tripled, or even raised still further.

This remedy is best taken in the morning, fasting. I have repeatedly proved that those persons who use at the same time the decoction and the pills obtain a favourable result.

Its use requires no change in the ordinary diet. I have always allowed persons to eat according to their desire; and, apart from too much farinaceous food, beer, prolonged baths, and a too sedentary life, which it is always necessary to avoid, I never impose serious privations.

The action of the Fucus on the system is very easily proved. After using it some time the patient feels lighter, more active, the stomach acts with more rapidity, and the hour of repast is more impatiently looked for. Flatulency diminishes, and then disappears, with those who have habitually been accustomed to it. The act of digestion is no longer accompanied by flushings of the face, by fulness, weight in the epigastric region, and fits of heat towards the head.

It is not until after two or three septenaries that we begin to observe special and characteristic phenomena; then the urine of those under its influence becomes generally more abundant, and begins to present on its surface a coating or black film. It is from this period that the resolvent properties are manifested, and the first intimations of becoming thinner are displayed. This result, which some look forward to with much impatience, is every day more decided, and, although variable in degree, has never yet failed.

These different phenomena show us then in the *Fucus vesiculosus* a real stimulant of the absorbent system, concentrating principally its action on the fatty globules. The thinness which it determines is not always produced in a uniform manner; I have seen it limited to certain isolated parts, which are then almost always those where the fatty tissue accumulates in the greatest abundance. Thus, with one it is the chest, with another the abdomen, and with a third the nape of the neck and the upper part of the shoulders.

But the destruction of fatty matters is not all that the resolving properties of the Fucus is capable of accomplishing; for many observations seem to prove that the same properties may become useful in certain diseases, as cutaneous infiltration, passive dropsy, atonic gout, etc.

We should always be careful in anticipating those therapeutic results which are still undetermined, and which repeated experiments, carried on with the most scrupulous care, can alone demonstrate and substantiate. It will suffice at present to recognize in the Fucus a resolvent property of incontestable energy, one which has hitherto escaped the notice of observers, and the application of which is the more valuable and easy from the fact of its existing in a well-known and common plant, of but little cost, and which requires no modification when it is employed, either in the diet or general habits of the patients.

There is another point to be mentioned, which relates to the choice of the Fucus,

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* We presume the author means 0·05 of a gramme (that is, about $\frac{3}{4}$ of a grain troy). There is much indistinctness in the subsequent remarks of the author as to the doses given by him, hence we forbear quoting them. The communication of Dr. Godefroy on the same subject, further on, is more explicit.—Ed. Ph. J.

and which is here of great importance. We know that the *Fucus vesiculosus* belongs to a family which contains hundreds of species; that many of these are almost inactive, and the greater number of the others perfectly useless as remedial agents; hence it is absolutely necessary not to lose sight of the botanical characters of the true *Fucus vesiculosus*.

The neglect of this has given rise to daily deceptions, and I have seen many persons from the same cause lose their time in lengthened and useless experiments.

It was thus also that a patient who complained of having taken for three months, without any result, large quantities of the Fucus which I had prescribed for him, and which, upon being brought to me, I found to be the common Grass- or Sea-wrack (*Zostera marina*), which is used by upholsterers to stuff mattresses. I am not ignorant of the difficulty which is experienced, even in Paris, in procuring the true *Fucus vesiculosus;* because I have had repeatedly offered to me, under that name, by justly celebrated houses, the *Fucus nodosus*, which is far from possessing the same activity, and when analysed furnishes scarcely the twentieth part of the products obtained from a like proportion of the *Fucus vesiculosus*.

Communication from Dr. Godefroy on the same subject.

The author experimented with this substance upon himself. He gathered the Fucus at St. Malo, where it is very abundant, and had made of it an hydro-alcoholic extract. This extract, he says, is hygrometric; and thus, if it be desirable to administer it in the form of pills, it is expedient to prepare a small number only at a time, to silver them, and to preserve them in a large quantity of some absorbent powder.

"I am," says M. Godefroy, "fifty-seven years old; I am 1m,74 in height (about 5ft. 6in.); my bones are small, my obesity principally seated about the belly. On the 6th of March, previous to any treatment, I weighed 76 kil. 500 (about 11 stones 10 pounds). From the 6th of March, I took, as uniformly as possible, every day, three pills, each of which contained 30 centigrammes (about 4½ grains) of the hydro-alcoholic extract of the *Fucus vesiculosus*, the first at six o'clock in the morning, the second at ten o'clock in the morning, and the third at five o'clock in the evening, at the commencement of each of my meals, and without making any change in my ordinary mode of living.

"Under the influence of this remedy, my urine became more abundant, more coloured, and more odorous than usual. This was the only phenomenon which I noticed during its use.

"On the 10th of April, after having taken ninety pills, I was weighed; I had then lost 1 kil. 500 (nearly 3¼ lbs.).

"From the 10th to the 20th of April, I took about two pills daily, one at six o'clock in the morning, and the other at five o'clock in the evening; at this period, I resumed taking three pills a day until the 18th of May, at which time, having taken a further number of ninety pills, I was again weighed—taking care to do so at the same hour of the day, and in the same clothing as before. I had then lost 1 kilogramme more, thus weighing at that period not more than 74 kilogrammes. I had thus lost from the 6th of March to the 18th of May, 2kil. 500 (about 5¼ lbs.), without any change in my diet or general habits, and without having experienced any inconvenience from the use of this remedy."—*Revue de Thérapeutique Médico-chirurgicale, et Journal de Pharmacie et de Chimie.*

NOTE UPON THE LEAVES AND FLOWERS EMPLOYED IN PHARMACY.

BY MONSIEUR E. FILHOL.

In the course of my researches on the colouring matters of plants,* I have often had occasion to observe a fact very well known to pharmaciens; I mean the decoloration of leaves and flowers under the influence of light, air, and damp.

I thought that it would be useful to find out if the colouring matters disappeared

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* Pharm. Journ., vol. ii. Second Series, p. 333.

of themselves only, or if, on the contrary, this disappearance was not accompanied at the same time with an alteration of the remedial principles when such were combined with them.

Some experiments of this kind have been already tried by chemists, but we have not had as yet any connected work upon the subject. The following considerations will show how desirable it is that this matter should be seriously investigated.

The result of numerous experiments which I have made during some years, shows, that leaves, besides containing *chlorophyll*, also contain *quercitrin*, or *quercetin*, and sometimes both these matters. Sometimes also, small quantities of the yellow colouring matter of flowers, known by the name of *xanthine*, may be found.

The red, rose, and blue colours of flowers are due to *cyanine*.

Yellow flowers owe their colour to *xanthine*, *xantheine*, or *croco-xanthine*.

In short, almost all flowers contain, like leaves, either *quercitrin* or *quercetin*; they contain also notable quantities of sugar. When we compare the amount of *quercitrin*, in leaves tried with care, and sheltered from the influence of the air, light, and damp, with leaves of the same species badly preserved, and such as are sometimes found in the drug trade, we find these latter to contain much less than the former. For then, instead of obtaining a definite and crystallizable compound, we only obtain some matters of an extractive character,—a result which is due to the alteration of the proximate principles originally contained in the plant.

The same thing takes place in flowers under similar circumstances.

It may be ascertained further, that the latter impoverish in sugar at the same time that they become decolorized. Moreover, it is easy to perceive that the odorous principles also, at the same time, disappear.

When we isolate the vegetable colouring matters which I have noted above, we can easily ascertain that these matters, when pure, alter but very slowly when in contact with the air, light, and damp; but that it is quite otherwise when they are associated with vegetable tissue, either in leaves or flowers; for then they disappear with great rapidity. One would say, that the cellular tissue acts, in such a case, like spongy platinum, and facilitates the combination of the elements of the air or of water with the proximate principles contained in plants.

This fact appears to me to be of the highest importance; for, since some proximate principles which can be preserved for an indefinite period when pure are thus altered when they are associated with vegetable tissues, it is probable that those substances which appear to us to have a great stability are also destroyed in a short time under the influence of light, air, and damp, when they are associated with vegetable tissues.

It would be very useful to ascertain whether alkaloids, vegetable acids, etc., do not disappear, like sugar and colouring matters, when the plants which contain them are altered. We know already that the leaves of Digitalis contain less *digitaline* when they are badly dried, than under a contrary condition. It seems probable that the alkaloids exist in smaller proportion in the leaves of Belladonna, Stramonium, Nightshade, etc., which have been decolorized under the influences mentioned above, than in leaves of a like kind which have been collected, dried, and preserved with care.

Most druggists in the south of France appear to forget, that, if the plants which they sell to the pharmaciens, and which form the raw material for the preparation of the various medicinal powders, extracts, syrups, tinctures, etc., are not well preserved, such preparations lose their activity.

My object in publishing this little note has been more especially to show, that when leaves or flowers have lost their colours, it is not alone the colouring matters that have disappeared, but also with them several other proximate principles which it would have been important to preserve.—*Compte-Rendu de la Société d'Emulation des Pharmaciens de la Haute-Garonne, et 'Journal de Pharmacie et de Chimie.'*

ON THE EMPLOYMENT OF THE *VERATRUM VIRIDE* IN THE TREATMENT OF DISEASES.

(*Read at the Annual Meeting of the British Medical Association.*)

BY EPHRAIM CUTTER, M.D., OF WOBURN, MASSACHUSETTS, N. A.

The author alluded to the fact that *Veratrum viride* is indigenous to North America. The best preparation is that of the tincture of the root—four ounces to the pint of alcohol, specific gravity 0·917; the doses of which are as follows:—

Adults, 7 to 10 minims,
Children, 3 to 5 minims,
Infants, ½ to 1 minim,
} Every two hours, or *pro re natâ*.

Sometimes, from idiosynerasy or other cause, the above doses are insufficient; it is then necessary to increase them in quantity or frequency until nausea or vomiting supervenes. The author has divided his subject in the following manner:—

1. As a local remedy.
2. As a cardiac sedative.
3. As an arterial sedative.
4. As a nervous sedative.
5. As an emetic, diaphoretic, and diuretic.
6. As a toxicological agent.
7. Its comparative value with agents of the same class.

1st. As a local agent, the *Veratrum viride* root (which only is officinal) is a powerful sternutatory and errhine. The author has employed it thus where there was dryness and swelling of the Schneiderian membrane, with the effect of establishing the secretion and clearing the passages. In the form of ointment, combined with sulphur and lard, Dr. Workman, of Worcester (Mass.), stated that he had succeeded in completely removing chronic prurigo, which had resisted various other remedies. In the form of cataplasm the root has been prescribed for ulcers in the leg, mastitis in puerperal women, and swollen rheumatic joints. It more accords with the times to use lotions of the diluted tincture or of the decoction. Besides, in the cases mentioned, it is thus employed as a stupe to the abdomen in peritoneal irritation and inflammation.

2nd. As a cardiac sedative. This term is employed for therapeutical convenience. Palpitation, irritability, and tumultuousness of the heart, also hypertrophy, valvular lesions, rheumatic and simple inflammation, are mentioned as to be treated under this head. Internal aneurism, hæmoptysis, and headache from excited circulation may come in therapeutically here. Sometimes in cases of organic disease the author has noticed a relief to the *feelings* of the patient, even when the pulse is not reduced. It should be given three times daily in full doses.

3rd. As an arterial sedative, the *Veratrum viride* is employed in affections characterized by febrile symptoms of sufficient intensity to be interfered with. It lowers the pulse, respiration, and heat of surface. It does not destroy the inflammation, but so restrains the violence of its action as to render the progress of the disease milder, the comfort of the patient greater, and ensures a better convalescence and recovery, from the fact that the vital forces are husbanded. It is not given to the full depressing point of the medicine. The diseases enumerated as coming under this head are—acute bronchitis, pleurisy, pneumonitis, rheumatism, tuberculosis; typhoid, typhus, and eruptive fevers; fevers resulting from surgical operations, burns and wounds, colitis. Full dose every two or three hours, keeping within the nauseating point.

In case the above complaints are of a very severe type, it is advised to push on in full doses, once an hour or half-hour, until the full effects are produced, such as vomiting, coldness and paleness of surface, a very marked reduction in the frequency of the pulse and respirations, diaphoresis, diuresis, and nervous symptoms of prostration, etc. It is claimed that thus all the good effects of depletion can be produced without the loss of a single blood-corpuscle. It can be persisted in as long as it is indicated; bleeding cannot. Again, in rheumatism, with the *Veratrum viride* there is no danger of metastasis to the heart.

4th. As a nervous sedative, it may be employed in chorea, convulsive affections,

and acute mania. It would seem adapted to these diseases *à priori*, from its physiological powers in numbing and stiffening the muscles. It is not narcotic. But opinion is divided on this point. Those who have experienced its full powers report no clouding of the brain. Sleep has been induced by it simply by allaying the excitement of the nervous symptoms. Still opiates are given with it.

5th. As an emetic, diaphoretic, and diuretic, it is not much used. There are other agents better adapted to produce emesis. The diaphoretic effects are noticed among the full effects; hence the *Veratrum viride* would not be desirable in this respect. As a diuretic, physicians have noticed its effects somewhat, but the only well-attested observation was by Dr. S. W. Abbot, U. S., who, in health, under the *Veratrum viride*, found his urine increased from 25·5 to 35 ounces in a day, and the specific gravity lowered from 1024 to 1020.

6th. As a poison. A fluid drachm is the largest dose of the above tincture known to have been taken. It was done by mistake. The effects were severe, but were not fatal. No doubt it is possible to overwhelm the action of the pneumo-gastric nerve by continuing the administration in over-doses, but no well-authenticated case of poisoning has come to the knowledge of the writer. Alcoholic stimulants and opiates, freely given, are the best antidotes.

7th. Compared with the *Veratrum album*, it rarely purges. It is prompter than Digitalis; less permanent in its effects than antimony.

Veratrum viride was commended by the author as worthy of trial. Reference was made to the mode of introduction, having been tested by medical societies in America regularly. It was thought that the status of medical science would be raised by the contemporaneous testing of all drugs by medical associations in their united and individual capacity.—*Lancet.*

MISCELLANEA.

The New Pharmacopœia.—In consequence of some difficulties having arisen with respect to the publication of the new Pharmacopœia, a bill has been brought in by the Lord President, providing, in the first place, that the General Council of Medical Education and Registration shall be deemed to be, and to have been, from the date of its first establishment, a corporate body, with capacity to hold lands for the purposes of the Medical Act; and in the second place, it directs that the British Pharmacopœia, when published, shall for all purposes be substituted for the existing Pharmacopœias, and that any Act of Parliament, Order in Council, or custom relating to any of these, shall be deemed, after the publication of the British Pharmacopœia, to refer to it.

"Rennet Wine."—In a communication to the 'Dublin Medical Press,' July 16, Mr. George Ellis strongly recommends this preparation in cases of dyspepsia, as being far superior to pepsine. The following is the mode of preparing it:—Take the stomach, or rennet bag, as it called, of a calf fresh from the butcher; cut off about three inches of the upper or cardiac extremity, which portion, as it contains fewer glandular follicles, may be thrown away; slit up the stomach longitudinally; wipe it gently with a dry napkin, taking care to remove as little of the clean mucus as possible; then cut it into small pieces (the smaller the better), and put all into a common wine bottle; fill up the bottle with good sherry, and let it remain corked for three weeks. At the end of this time it is fit for use. *Dose.*—One teaspoonful in a wineglassful of water, immediately after meals.

Horses Poisoned by Arsenic.—Recently Mr. Matthews, a farmer at Sanford, near Abingdon, lost six horses by poison. It appears that one of the men found a parcel on the stable premises, which was supposed by Mr. Matthews to be a powder for horses; and he directed his carter to give a little of the powder to the animals. Soon afterwards alarming symptoms appeared, and six of the horses died. It was found that the powder consisted of an arsenical mixture for the purpose of destroying vermin.

Fatal Explosion of Gun-Cotton.—A fatal explosion of gun-cotton recently took place at Brooklyn, New York. Mr. L. M. Dornbach, an able chemist and photographer, was packing gun-cotton for shipment, and whilst punching it down somewhat forcibly in a cask containing 38lbs., it partially exploded and set his clothes in flames. A few seconds afterwards, another and more serious explosion followed, which resulted in such injuries to Mr. Dornbach as to cause his death in a few hours. Gun-cotton rarely explodes from mere percussion; but a circumstance like that above recorded is suggestive of caution in the use of this innocent-looking material.—*Photographic Journal.*

Alleged Antidote for Strychnine.—A correspondent of the 'Dublin Medical Press' of July 23, writes :—"I was called to see a valuable black pointer bitch, and found her lying in the stable, perfectly stiff, with her head thrown back, and her mouth so fast shut that it required an iron bar to open it, and to bend a joint was impossible. (It appeared that the dog had eaten a portion of a poisoned rabbit.) I took about five grains of *turpeth mineral*, diluted in a little water, and with the assistance of two men got her mouth open and succeeded in administering the drug; in about ten minutes the bitch opened her eyes and shortly afterwards threw a quantity of frothy matter off her stomach; presently her limbs became pliable, and in about half an hour she was able to walk about, and was perfectly recovered in a short time."

Small-Pox among Sheep.—A disease of a most malignant nature has recently broken out among the flocks of Mr. Joseph Parry, of Allingham (Wiltshire). The symptoms exhibited were great internal suffering, loss of appetite, and general prostration. The bodies were covered with pustules, and a viscous matter ran from the nose and eyes, rendering the sheep almost blind, and emitting a most offensive odour. All local remedies having failed, Professor Simonds, of the Royal Veterinary College, was consulted, and he has pronounced the disease to be small-pox. This disease, it appears, was unknown among English flocks until 1847, when some Spanish sheep were imported with the disease on them.

In compliance with Professor Simond's suggestion, the whole of the sheep that had not already been attacked were inoculated, and the result of the experiment is anxiously looked for.

A correspondent in the 'Times,' M. D., states that about twenty-five years ago a similar epidemic broke out in India among some merino sheep imported from Europe. In this case all the diseased sheep were separated from those unaffected, and of the latter, twelve were vaccinated, and twelve were inoculated. The vaccination totally failed, but those that were inoculated did well. Another correspondent of the same paper gives it as the result of his experience, that neither inoculation, which must intensify and diffuse the poison, nor vaccination, is of much use, and that separation would be the best plan of management.

Unlawful Administration of Cantharides.—At the Surrey Sessions, August 6, a lad, named Joseph Gondono, aged 13, was tried on the charge of unlawfully causing to be administered to Ruth Glynn a certain drug called Cantharides, so as thereby to cause her grievous bodily harm. It appeared from the evidence that on the 10th of July the prisoner had employed a boy, George Russell, to purchase some Spanish flies of a chemist; and having put them into a tart, he had induced another boy, Edward Chapman, to give to the girl, telling her that it was sent by Gondono. The girl ate the tart, and it was proved that the prisoner had taken advantage of the effects produced by the Cantharides to take liberties with the girl. Mr. Morton, Chemist, Richmond, proved the sale of the Spanish flies to the boy Russell; but he was not aware that they were intended for an improper purpose. The jury found the prisoner *Guilty;* but sentence was deferred, in order to ascertain the result of the girl's illness; and the prisoner was admitted to bail. When the prisoner was brought up for judgment a certificate was produced, to the effect that the girl was still an inmate of St. Mary's Hospital, suffering from the effects of the poison. The prisoner was sentenced to two years' imprisonment with hard labour, and at the expiration of that time to be sent to a Reformatory for three years.

Venomous Caterpillars.—A most singular case, perhaps the only one on record, of death caused by caterpillars, occurred a few days ago in the commune of Dardilly,

near Lyons. A little boy, not more than eight years old, had gone into a neighbouring wood in quest of birds' nests. Perceiving one on the top of a tree, he climbed up, but in so doing shook down an immense number of caterpillars, many of which fell on his shirt, his only upper garment, and soon covered his breast, which was bare, and penetrated to his arms and shoulders. For a few minutes the child took no notice of this, but he soon felt such an itching sensation that he was compelled to get down again and run home for assistance. Upon examination, his skin appeared covered with large red spots, which were soon followed by a general swelling, then by fever, somnolency, and delirium; and, notwithstanding all medical care, death ensued in the course of a few hours. The kind of caterpillar which caused this disaster was the *Bombyx processionea* of Réaumur, a very venomous species. Entomologists know that if a nest of these insects be touched, or only stirred up with a stick, the person so doing, and remaining for some time near the spot, within reach of the emanations arising therefrom, will be attacked with a papulous eruption of a more or less confluent nature, which will last several days, and be attended with violent itching. Dr. Calmell, physician to the hospital of Charenton, had preserved a nest of these caterpillars in a large glass phial, which was not opened for upwards of ten years. At length, the phial being accidentally wanted, it was opened in the presence of several persons, who all caught the eruption. This strange property has even suggested to several members of the faculty the idea of using these caterpillars in cases in which it is required to subject the skin to a strong and permanent irritation. We may remark, in conclusion, that the number of caterpillars which infest the trees this year all over France is quite unprecedented,—a circumstance which has called the attention of the authorities and of various learned societies to the question of protecting insectivorous birds, the only really efficacious enemies of the caterpillar.—*Galignani's Messenger.*

In reference to the above, the editor of 'The Field' remarks:—In this country, too, our hedges and woods are defoliated by caterpillars, owing to the destruction of small birds by means of poisoned wheat. The natural history of the procession moth, as well as the injurious effects of its hairs, were known from the earliest times. See Pliny's N. H., b. 38, c. 9; Amoureux, p. 158; Mouffet, p. 185; Réaumur, vol. ii. pp. 191-5; and Kirby and Spence, vol. i. pp. 130, 475, and vol. ii. p. 23. The effect of the hairs of this insect is not generally fatal, but the irritation is intense. An Australian species, *Lasiocampa vulnerans*, is still more fearful in its effects."

A correspondent of 'The Lancet' of July 19, also states, that "the irritation is undoubtedly caused by the hairs of the caterpillars, which do not affect the hard skin of the hands, but readily enter that of the face and neck. The 'woolly-bear' (*Arctia coja*) is comparatively harmless in this way, except to very delicate skins; but the hairs of the larva of the brown-tail moth (*Porthesia chrysorrhœa*) cause intense agony; and the French papers teem with notices of 'poisonings' by the larva of the procession caterpillar (*Bombyx processionea*), which is not found in this country."

Attempted Suicide by Laudanum.—John Burns, aged thirty-five, who described himself as a writer and public lecturer, was charged at the Clerkenwell Police Court with attempting to commit suicide by taking a quantity of laudanum. He was found by a policeman, lying on a doorstep in the act of taking a bottle from his mouth; portions of two bottles which had contained laudanum were found under him. He was taken to the hospital, where the stomach-pump and other means were used to restore him. The prisoner said that drunkenness was the cause of his making the attempt on his life; he refused to mention the names of his friends, and when told that he would be remanded, replied, "You may lock me up as long as you like, I shall never mention the names of those who were my friends; you had better lock up the public-houses."

Suicide by Strychnine.—On Monday, August 4, an inquest was held by Mr. James Bird, coroner, at Chelsea workhouse, on the body of Alfred Thomas Groom, aged fifteen, who died from the effects of strychnine and essential oil of almonds. It appeared that the deceased was in the employ of Mr. Armstrong, chemist and druggist, King's Road, Chelsea, and his duty was to dust the bottles, and serve a few articles such as salts and antibilious pills, but he was not allowed to dispense. On Friday, August 1, he was found at the back of the shop apparently asleep, but when touched

by Mr. Armstrong he went into strong convulsions. Mr. Ward, surgeon, was sent for, and he administered an emetic, and applied the stomach-pump, but death took place in about half an hour. A *post mortem* examination was made by Mr. Ward, and an analysis of the contents of the stomach, by Mr. Rodgers. Strychnine and essential oil of almonds were found, the former preponderating; and Mr. Rodgers stated that he had no doubt that the deceased had died from the effects of those poisons. It appeared that Mr. Armstrong had detected the deceased in some act of dishonesty, and had given him notice to leave. The bottle, which was labelled "Strychnine, Poison," had not been opened for six months, and there was found to be a deficiency of sixteen grains in its contents. The coroner said it was clear that the deceased had died from the effects of poison, but there was no evidence to show that he had taken it, nor of his state of mind at the time. The jury returned a verdict in accordance with the suggestion of the coroner.

Death from Chloroform.—A death from chloroform took place on Saturday, June 22, at the United Hospital, Bath, during an operation for the removal of a tumour from the lower jaw of a woman, named Susan Harrison, aged forty. At the inquest, the House Physician, Mr. Barter, deposed to administering a drachm of chloroform on a napkin, and afterwards a second drachm when the first had evaporated. Before the operation was finished, the patient became slightly conscious; another drachm was poured on the napkin; she took one inspiration, when he noticed the pulse suddenly stop. The napkin was removed, and the operation suspended. She gave three or four gasps, and in about half a minute she was dead. Every effort was made to restore animation, but without effect. Mr. Gore, who performed the operation, stated that no precaution usual in such cases was neglected. On *post mortem* examination, it was found that the deceased had fatty degeneration of the heart. The jury returned a verdict that death was caused by the effects of chloroform.

Death from Chloroform.—On Monday, August 11, an inquiry was held at King's College Hospital, before Mr. Bedford, coroner, respecting the death of Elizabeth Frud, aged seventeen, who died while under the influence of chloroform. Mr. R. Partridge, surgeon of the hospital, stated that the deceased was admitted on the 23rd of July, and died on the 8th of August. She was suffering from a very offensive mortifying wound, and it was necessary, for the purpose of closing the wound, that an operation should be performed. The deceased consented to take chloroform, and as she was a very nervous girl, it was administered with great precaution. It was found that the deceased had a feeble and fatty heart, which had not been discovered previous to the administration of the chloroform. The following verdict was returned:—"That the deceased died from the administration of chloroform, in consequence of a disease of the heart; but the jury found that the chloroform was properly administered."

Death from an Overdose of Opium.—On Thursday, August 7, an inquest was held by Mr. Serjeant Payne, coroner, at the board-room of St. Bartholomew's Hospital, respecting the death of Mr. W. Harrison Keyle, aged fifty-nine, of Sydney Place, Goswell Road. On the Thursday previous he was found lying on his bed quite insensible, and was conveyed to the hospital: it appeared that deceased had for some time past been in a low, desponding state. It was stated by the resident medical officer that deceased had taken a large quantity of opium, which in all probability had accelerated his death, owing to the diseased state of his lungs, kidneys, and bladder. The jury returned a verdict of "Death from disease of the lungs, etc., accelerated by an overdose of opium."

Poisoning by Prussic Acid.—On Friday, July 18, Mr. John Humphreys, accompanied by Dr. Lankester, resumed an adjourned inquiry touching the death of Sarah Ryan, aged eighteen, who died suddenly on the 6th of July, at No. 16, Coles Terrace, Barnsbury Road, where she had gone to dine with a friend. Mr. John Wyse Wilson, surgeon, deposed that on the day mentioned above he was called in and found the young woman dead in the kitchen. He had since made a *post mortem* examination; he was of opinion that death was produced by prussic acid. Dr. Harley, professor of medical jurisprudence to the University College of London, stated that he received from Mr. Wilson several jars containing portions of the intestines, and had applied

the usual tests to them. His opinion was that death was caused by the effects of prussic acid. The inquest was adjourned. On Tuesday, August 19, the inquiry was resumed, when the jury returned an open verdict, that the deceased died from poison, but how or under what circumstances there was no evidence to prove.

Poisoning by Mandrake.—Two children died lately at Melton Mowbray, from the effects, it is said, of mandrake-root, the children having eaten a quantity of the roots found in the field where they were playing.

Poisoning by Strychnine.—On Tuesday, July 29, Elizabeth Vamplew, aged thirteen, was tried before the Lord Chief Baron, at Lincoln, on the charge of the wilful murder of Kate Mary Taylor, an infant about ten weeks old, by administering a poisonous substance called "Battle's Vermin Killer." It appeared from the evidence that on the 10th of July, the child was left in charge of the prisoner, and the mother hearing it cry went to try and feed it, but finding that it refused its food she took it to her own bed. The child still grew worse and the mother put it into a warm bath, but it died on the following morning. The prisoner had told one of the witnesses that she had given the child poison, but did not think it would kill it so soon, stating as a reason that she did not like the trouble of attending to the child. A *post mortem* examination of the body was made by Mr. Roe, a surgeon of Louth, and the stomach and intestines were examined by Professor Taylor, and a minute portion of strychnine was found. The sale of a packet of "Battle's Vermin Killer" to the prisoner was proved by the wife of a grocer at Grimbleby. This powder consisted of flour, coloured with Prussian blue, and containing about three-quarters of a grain of strychnine in the 3d. packet. The counsel for the prisoner contended that the evidence failed to show that the prisoner had the capacity to commit the crime, or had acted with deliberate malice. His Lordship, in summing up, drew the attention of the jury to the distinction between the crimes of murder and manslaughter, and stated that they must be satisfied, before they could find the prisoner guilty, that she was conscious, and that her act was deliberate. Verdict, "Guilty of manslaughter;" sentence deferred.

Poisoning by Arsenic.—On Tuesday, July 1, Mr. Cooke, Astronomical Instrument maker, of Bishophill, York, with his wife and family and a visitor, shortly after dining were attacked with severe vomiting. Mr. Reed and Mr. Proctor, surgeons, were called in; and after the prompt administration of the usual remedies the sickness was relieved, and on the following day the family were nearly restored to health; but on the Thursday the family were again attacked with the same symptoms. It was then suspected that the salt kept in the house had been mixed with some deleterious substance, and it was subjected to analysis by Mr. Proctor, who found it to contain about 30 per cent. of arsenic: arsenic was also found in the flour. These circumstances were reported to the police for the purpose of ascertaining by what means the arsenic was mixed with the salt and the flour. At present, it is supposed that the admixture was accidental.

Poisoning with Amaranthus communis.—Four girls at Udine ate, by mistake for carrots, the root of this plant. In a very short time cramps of the stomach, vomiting, and diarrhœa set in with great severity, and for a short time the issue of the cases seemed doubtful. However, the use of rum, cinnamon water, laudanum, and ether internally, and dry and ammoniacal frictions, at length gave relief.—*Journ. de Chim. Med.*, *May* 1862.

Alleged Attempt to Poison by Arsenic.—At the Sheffield Police Court, Peter Simpson was charged with attempting to poison his wife and child with arsenic. The prisoner, who it appears lived unhappily with his wife, had been before the bench on several occasions for the purpose of having their differences settled. It appears that on the present occasion she had made the tea as usual, but on tasting it and giving some to the child, it was found to have a peculiar taste and left a burning sensation in the mouth. A portion of the tea was examined by a chemist, and found to contain arsenic. The prisoner was remanded for further inquiries, and it was thought that the wife knew more about the contents of the tea-pot than was at first supposed.

REVIEW.

THE ART OF PERFUMERY, AND THE MEANS OF OBTAINING THE ODOURS OF PLANTS: with Instructions for the Manufacture of Perfumes for the Handkerchief, Scented Powders, Odorous Vinegars, Dentifrices, Pomatums, Cosmetics, Perfumed Soap, etc. With an appendix on Preparing Artificial Fruit Essences, etc. By G. W. SEPTIMUS PIESSE, Analytical Chemist. Third Edition. London: Longman and Co. 1862.

The fact of this useful volume having already reached its third edition, is of itself the best evidence that could be adduced of the want of such a book, and of its success in supplying that want. The present edition contains much new matter, which has been either supplied by the author himself, or carefully collected from other sources, so as to bring before the reader the best and latest information on the various subjects upon which it treats.

No Pharmaceutist can consider his library complete without a work on Perfumery; and we can cordially recommend the present volume to them as the best practical treatise on the subject to be found in the English language.

TO CORRESPONDENTS.

[INTERNATIONAL EXHIBITION.—The Report of the Jury on Medical and Chemical Products and Processes (Class II. Sect. B.) has (in common with the Reports of the other Juries) not yet appeared. We intend to re-publish it in our pages at the earliest period possible.]

R.S. (London), on behalf of the assistants in the wholesale drug houses, suggests that if druggists in the country would send their orders early in the week, the assistants referred to would be able to take advantage of the Saturday half-holiday.

Philo (Christchurch).—Newth's 'First Book of Natural Philosophy' would be suitable. Dr. Lardner's 'Handbook of Natural Philosophy' would comprise all the subjects alluded to.

A Registered Apprentice (Sheffield).—Bentley's 'Manual of Botany.'

A Correspondent (London).—*Essence of Sumbul.* In the absence of any recognised formula, we give the following:—Rad. Sumbuli ℥viij; Sp. Vini Rect. ℥xx; Aquæ Distillatæ ℥xj. Mix. Prepare by percolation.

A Founder (London).—The Ammonio-Citrate is intended.

Mr. T. H. Smith (Sittingbourne), alluding to the formula for *Unguentum Hydrargyri Nitrico-oxidi* (page 92), gives the following as a still further improvement:—Hydrarg. Nitrico-Oxydi ℥j; Olei Ricini ℥ij; Ceræ Albæ ℥j; Adipis ℥v. Mix.

Mr. Baldock and *Mr. Septimus Piesse* are thanked for their communications, which will receive attention.

R.B. (Exeter).—Any person whose age is not more than twenty-six, nor less than twenty-one years, is eligible for the office of dispenser under the Government.

Tempus (Leicester).—(1). In the absence of a barometer, we know no better indicator than the ordinary "storm-glass." A description of the latter will be found in our 2nd vol., p. 777. (2) The solution referred to is, we presume, coloured spirit.

A Reader (Leeds).—The ethereal extract contains all the properties of the cubebs, but is not so suitable for making pills as the alcoholic extract. See any Formulary.

ERRATUM.—Page 88, *Petroleum:* for "any mineral product," read "any product."

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, ELIAS BREMRIDGE, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. IV.—OCTOBER 1st, 1862.

THE SCHOOL OF PHARMACY.

ARRANGEMENTS FOR THE ENSUING SESSION.

The proposition to adopt for the first time a system of professional education, involving an entire change in the mode of acquiring the qualifications required, by law or public opinion, for conducting a business in which no such qualifications had been previously considered necessary, could hardly be expected to meet with a very ready or general assent from those who were called upon to put it into active operation. The question of education, indeed, as affecting the public at large, has hardly ceased to be a debatable one, although few now like to avow themselves unfavourable to the promotion of education among all classes. But the educational measures which were proposed some twenty years ago by the promoters and founders of the Pharmaceutical Society, while they entailed a new or considerably increased expense upon those for whose immediate benefit they were intended, could only be carried out with the cooperation and active assistance of men who not only could not participate in the benefits resulting, but who, in furthering the proposed object, would be contributing to train up competitors in business possessing qualifications superior to their own. Liberal-minded men there were and still are among the Chemists and Druggists of Great Britain, who, disregarding mere personal considerations, were actuated by a desire to elevate the position of the body to which they belonged by rendering its members more skilful and better informed in all that relates to the exercise of their professional duties. The advancement of Chemistry and Pharmacy, and the promotion of a uniform system of education among those who should practise the same, were fundamental principles of the Society to which these men belonged. In founding the Institution established for the purpose of carrying out the objects they had in view, means were immediately adopted for promoting pharmaceutical education, and these means were of the most efficient character. Four distinct courses of lectures were established, on subjects considered most essential in the education of Pharmaceutical Chemists—namely, Botany, Materia Medica, Chemistry, and Pharmacy. Dr. Anthony Todd Thomson was appointed lecturer on Botany, Dr. Pereira on Materia Medica, Mr. Fownes on Chemistry, and Mr. Redwood on Pharmacy. In addition to these means of instruction, a laboratory was fitted up, capable of accommodating twenty or thirty pupils, where practical instruction was given in the manipulations and processes involved in the production of substances used in medicine, as well as in their

examination and analysis. Thus a very comprehensive and complete system of pharmaceutical education was set on foot, in which were engaged as teachers some of the most distinguished men of the age, in their departments of Science. To encourage the young men, for whom these means of instruction were provided, to take advantage of them, admission to the lectures was offered at a merely nominal fee; the payment of the lecturers and other necessary expenses of the lectures and laboratory course being undertaken by the members of the Society with whom the system originated. The Council of this Society, in speaking some ten or twelve years afterwards of what had been done towards promoting pharmaceutical education, say, "the expenditure of the Society for purposes of education and scientific improvement has, from the time of its commencement, exceeded an average of £3000 per annum." This sum was liberally contributed by the Chemists and Druggists throughout the country for the support of a system, the object of which was to raise the standard of pharmaceutical qualification by inducing students to adopt a systematic and scientific course of study, and subsequently to submit themselves for examination as a test of their proficiency. Strange to say, the parties for whom this expensive system was organized appeared to be insensible to the value and importance of the benefits offered to them, or at any rate, they were not prepared at that time to avail themselves of the offer so generally as it was expected they would have done. Not so strange was it that the members, after providing the repast and inviting the guests, after leading the way even, by entering themselves to the lectures, and thus setting an example to those for whom the school was especially intended, when they found how small was the return for the outlay incurred, began to doubt the necessity for keeping up so extensive and costly a system. The question of education under these circumstances was found to be a very debatable one; the school and its maintenance were subjects of frequent attack, and the strongest advocates for the promotion of pharmaceutical education found it necessary, in order to ensure the continuance of the school, greatly to reduce its cost to the Society. The Professors were reduced from four to two; each Professor being required to unite two subjects in his course, so as to bring the whole matter within a smaller compass. At the same time the Laboratory, which had been kept up at an annual cost to the Society of about £200, was handed over to the Professor of Chemistry and Pharmacy, who undertook to conduct it upon his own pecuniary responsibility, thus relieving the Council from the charge arising from this source.

With some fluctuation, but with no material change permanently for better or worse, the school has continued on this footing for seven or eight years, during which time there have been usually from forty to fifty pupils annually instructed in the laboratory, and classes varying from fifty to seventy attending at the lectures. The attendance in the laboratory was generally equal to the accommodation provided there; but this was not only limited in extent, but imperfect in the means afforded for working, and much inconvenience was frequently experienced from the contiguity of the operating rooms to other parts of the Institution through which they were distributed. Propositions had repeatedly been made for improving the accommodation and altering the arrangements of the school; but the absence of any available means of effecting these objects without further taxing the members of the Society, precluded the possibility at that time of accomplishing what many of the best friends of the Society desired. Such means, however, were afterwards placed at the disposal of the Council by the liberal bequest of two thousand pounds, left by Mr. Bell for the special purpose of maintaining the school, or otherwise furthering pharmaceutical education. It was decided that no better or more appropriate application could be made of this bequest

than the employment of it in erecting a suite of laboratories, capable of accommodating a large number of pupils, and provided with all the necessary conveniences for chemical and pharmaceutical operations. But the question still remained, where was this laboratory to be? Most persons agreed that it ought to be separated from the house in which the general business of the Society was conducted; but to effect this other premises besides those already occupied by the Society would be required, and it was not found practicable to obtain any suitable for the purpose. The principal laboratory then in use was at the basement of the house, and the fumes and gases liberated there were frequently diffused through all the rooms above. The proposition to build a suite of laboratories at the top of the house originated with the Professor, whose plan for their construction and arrangement, although strongly opposed at first, was finally adopted, and carried out under his superintendence. The result has been entirely satisfactory; the inconveniences experienced in the old laboratories no longer exist, and ample space is provided for a large number of students, whose operations are conducted in lofty rooms, well lighted and ventilated, and sufficiently cut off from other parts of the building to prevent the communication of noxious fumes. But these results have not been obtained without incurring a very considerable outlay, part of which has been defrayed from the funds of the Society. There is no longer deficiency of accommodation, either in extent or completeness, and it is now the duty of the Council to make the best use of these means, not only with regard to the benefits to be conferred upon students, but also with regard to the interests of the Society whose funds have contributed to provide the means.

None of the public laboratories for practical instruction in chemistry are strictly self-supporting; it has been found necessary to subsidize them from some fund, other than that contributed as fees by the students; and it would be unreasonable to expect that the laboratory of the Pharmaceutical Society should be an exception to the rule. But although it may not be possible to make the laboratory pay full interest on the large sums invested in its establishment, there ought to be some return of a more substantial nature than the credit of conferring good by promoting pharmaceutical education. The Council of the Pharmaceutical Society are now the responsible parties in every sense. Having appointed a demonstrator and assistant demonstrator, who are fully equal to the duties to be performed, and whose time will be wholly devoted to these duties, it is hoped that the class will be so far increased as to raise the receipts much above the current expenses, and thus to justify the outlay of capital, which amounts to a considerable sum.

The laboratory and the lectures were established and are maintained for the benefit of pharmaceutical students, whose special requirements have been studied in the educational arrangements which have been made. These arrangements have been recently revised and improved by the Council, and a new programme is issued, which may be obtained from the Secretary. If the efforts thus made to render the school of pharmacy fully efficient should be responded to by pharmaceutical students as they ought to be, and as we trust they will be, the present session may prove the commencement of a new era, in which the provisions for education so liberally made and maintained for many years, will be not only received but sought after, and not only recognised but appreciated and duly acknowledged by young men, who, in their turn, will become creditable members of the pharmaceutical body, and active promoters of pharmaceutical education.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *3rd September*, 1862,

Present—Messrs. Deane, Hanbury, Hills, Meggeson, Morson, Sandford, Savage, and Waugh,

Mr. Joseph Woodcock, of Leicester, was elected a Member.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE CASCARILLA, AND OTHER SPECIES OF CROTON, OF THE BAHAMA AND WEST INDIA ISLANDS.

BY WILLIAM F. DANIELL, M.D., F.L.S.,

Hon. Member of the Pharmaceutical Society of Great Britain.

Although much of the confusion which formerly prevailed, respecting the sources of the Cascarilla barks of the West Indies, have been dissipated by the researches of Woodville, Lindley, and other pharmaceutical authorities, nevertheless considerable doubt existed with reference to the species of Croton, that originally supplied the markets of Europe, and to which the term Cascarilla was first applicable. That the plant yielding the article of commerce, during the last century was also unknown, is evident from the discrepancy of opinion, that pervades the statements of comparatively recent writers. This obscurity, never entirely dispelled, has continued up to the present date. Some apparent inconsistencies in their descriptive account, requiring elucidation, I was induced during a tour of service in the Bahama islands in 1857–8, to make inquiries into the general history of the medicinal Crotons indigenous to the group; the results of which were placed in the hands of my friend Mr. Bennett, and published by him in the Journal of the proceedings of the Linnean Society.* From his careful revision of their botanical characters, intricate synonyms, and other specific details, I have been enabled to rectify many important inaccuracies, perpetuated in the works of Materia Medica.

Any attempt to trace the aboriginal uses of the Cascarilla barks, can only terminate in disappointment, owing to the rapid extinction of the Carib races, that from an early epoch populated these and other islands of the West Indian archipelago. These primitive inhabitants, according to report, were fully cognizant of their remedial and other economic properties, which they rendered subservient to the treatment of diseases, and other necessary purposes. If we may credit local traditions, the native priests or doctors, resorted to the dried plants for fumigations and in religious ceremonies; and while the fresh leaves were infused in their medicinal baths, the cortical portions were more exclusively reserved for internal administration. The dried bark also was reduced to a powder, and mixed with their tobacco previous to

* Vol. iv. p. 29.

smoking. The inhalation of this mixture was reputed to act as a powerful stimulant, and to induce effects analogous to those of intoxication.*

The European colonists who first settled in the Bahamas apparently obtained a partial knowledge of these appliances, in the course of time from the natives, and hence their practical value has been derived, and handed down to the present period. The famous Buccaneers who infested the secret Cays, or islets of the Bahamas, and inspired such terror by their piratical excursions in former centuries, appear to have held these products in high esteem. Selecting the fresh cortex, they infused it either in wine, or ardent spirits, and this constituted not only an agreeable bitter, but a prophylactic agent, for the preservation of health. Dried in the sun, and subsequently pounded into small fragments, it was smoked mixed with tobacco; and this method of employment, independently of the agreeable flavor inhaled, was equally considered to be an antidote against the attacks of febrile, and other local maladies. The system of conjoining these barks with tobacco, partly introduced into England and other countries of Europe towards the close of the seventeenth century, may be traced to these seafaring usages, which, again, were adopted from those of the Carib tribes. For the information which led to their appropriation, as one of the chief ingredients in the composition of incense, and other fumigating compounds, we are indebted to the labours of the early Spanish missionaries, who during their sojourn among the West India islands, gained a practical illustration of this aboriginal mode of employment.

I. Sweetwood Bark, or Bahama Cascarilla.

(*Croton Eluteria*, Benn.)

Elutheria Providentiæ, folio cordato subtus argenteo. Sweet Bark, s. cortex bene olens, *Petiver, Collect.* 4 *n.* 276.

Eluteria, *Linn. Hort. Cliffort.*, *p.* 486.

Clutia Eluteria, *Linn. Spec. Plant.* ed. 1. *p.* 1042 *(excl. synon. omn. præter Hort. Cliff.)*.

Clutia Eluteria, s. Cascarilla, *Woodville, Med. Botany, ed.* 1. *vol.* iv., *sup. fig.* 2, (1794.)

Clutia Eluteria, s. Cascarilla Clutia, *Woodville, Med. Bot. ed.* 3, *p.* 633, *pl.* 223, *fig.* 2.

Croton Eluteria, *Benn. Journ. Proceed. Linn. Soc.*, vol. iv. p. 29.

From this plant the ordinary Cascarilla bark of commerce is procured. The species is tolerably abundant in the Bahamas, especially in the larger islands of Andros, Long, and Elutheria, from the latter of which its appellation has been derived, owing to the great supply it formerly yielded. In New Providence, it flourishes only to a very limited extent, having become nearly extinct from previous demands. A number of small shrubs and young trees may yet be found, within the track of brushwood to the rear of Fort Charlotte, adjoining the town of Nassau, and a few isolated bushes in other districts of the isle.

Except a few local traditions referring to the use of the cortex for smoking, or fumigating purposes, in the religious or state ceremonies of the ancient Caribs, the data requisite to determine the various native preparations of this plant, are lost in obscurity. The custom of smoking the powdered bark con-

* The conjunction of other substances in the smoking of tobacco, with the view of modifying or improving its flavour, appears also to prevail among several of the Indian tribes of North America. During the late overland transit of the troops through Canada, powdered Willow-bark, an article much used for this object, by the Indians, was freely offered for sale, and it is stated that on trial, a peculiar taste and odour was imparted to the smoke

joined with tobacco, in vogue with the earlier European colonists, in these and the Caribbean islands, either to disguise the flavour of the herb, or as a prophylactic agent to avert attacks of sickness, may evidently be ascribed to their primitive usages. It is somewhat remarkable that Catesby, who visited the Bahama islands about 1722, should include a specimen of this shrub in his collection, without name or other explanatory remarks, a fact that would lead to the inference this product had not at that period acquired sufficient importance to constitute an article of export. Moreover, the mere descriptive outline of "*Elutheria Providentiæ folio cordato, subtus argenteo*, with the sole annotation of *Sweet bark, s. cortex bene olens*," in Petiver's collection of plants, will tend to confirm the opinion, that the bark had not been brought into popular request, otherwise such a special event would have been recorded.

Linnæus first briefly, but incompletely, described this species under the true synonym of *Cortex Ilatheria*, in the 'Hortus Cliffortianus' of the British Museum; but subsequently forgetting this detailed fragment, and quoting a series of discordant synonyms in his works, contributed greatly to complicate the identification of later specimens. In the first edition of his 'Species Plantarum' under the name of *Clutia Eluteria*, he correctly refers to the *Eluteria* of the 'Hortus Cliffortianus,' but in the following editions improperly inserts other Crotons, obviously distinct. Linnæus also classed several of these species by the generic title of *Clutia;* later botanists have however defined them to be true Crotons in the most comprehensive sense of the term. To Woodville, although he indiscriminately confounded the Jamaica (*C. Sloanei*, Benn.) and Bahama (*C. Eluteria*, Benn.) plants together, under the general designation of *Clutia Eluteria s. Cascarilla*, may be attributed the merit of having pointed out the plant producing the Cascarilla bark of modern commerce, at the same time truly stating the locality from whence it was imported. The difference and contemptible character of the specimens he figured in illustration, indicated such apparent inconsistencies, as to induce Pereira and other authorities to doubt whether he had clearly established the source of the drug in common use. Lindley finally decided the question, by obtaining from New Providence authentic specimens of this species of Croton, fully confirming the accuracy of Woodville relative to its local origin. The shrub is stated to have been introduced into England by P. Miller, but not being a showy plant, it probably became neglected, and was ultimately suffered to decay, as no traces of its existence could subsequently be discovered.

Under the aspect of a young tree, this species may sometimes be noticed, with a stem from 4 to 8 inches in diameter; the usual growth however is that of a small, compact-branched, scanty-leaved shrub, from 3–5 feet in height. The inferior portion of the stem is devoid of branches, erect, marked at irregular intervals by epidermoid greyish, or white rugous stains, and covered by a variety of parasitical lichens. The leaves are petiolate, at the base varying from slightly cordate to acute, obtusely acuminate or frequently abruptly acuminate, as if the apex had been cut off, pale or greyish green, sparingly clothed with peltate scales above; beneath, densely clothed with shining and silvery scales, which in the distance present a white color. They alter in size, in proportion to age; for it is a singular fact the younger the plants the greater are their dimensions. They average from 2–3 inches in length, and 1–1½ inches in breadth. In the arborescent form they become more narrow and elongated, lose their cordate base and are considerably reduced in dimensions, being only ½–1 inch long, and from ¼–½ inch wide. As the plant gains in growth the leaves fall from the lower branches, and are permanently collated at the summits of the younger branchlets. The inflorescence consists of numerous small, closely set white

petiolate flowers, male and female, attached to a simple spike, either terminal or axillary. They appear in March and April, and then diffuse around a most exquisite perfume. In the arborescent shrub, the spike is however uniformly terminal. The fruit, a small, roundish oblong, smooth, lobated capsule, is about the size of a pea, of a greyish or silvery hue. It is divided into three cells, each containing a small dark brown, oblong, shining seed, convex externally, with flattened sides, converging to a ridge, and about 2–2½ lines in length. The pericarp is covered with numerous silvery peltate scales, somewhat resembling those on the leaves. These capsules attain maturity in May and June. The cortical layers change from a pale, to dull red, according to age or dimensions of the plant.

In the late and previous editions of Pereira's 'Materia Medica,' this species has been denominated the sea-side Balsam, a name by which the *C. balsamiferum*, Linn., is recognized in the West Indian and Bahama islands. This title was conferred by Browne on a plant he considered to be identical with the *Croton Eluteria* of Swartz. The latter botanist however had apparently his doubts whether it was the same product, as he has not adduced it as a synonym in his descriptive account. From the circumstance of a thick balsamic liquor exuding from the younger branches, whenever wounded or broken, with other structural peculiarities, it is probable that the Crotons of Browne and Linnæus may be nearly allied, if indeed they are not synonymous. The *Croton Sloanei*, Benn., (*C. Eluteria*, Swartz), however, clearly differs from both.

Woodville quotes a German author, who states that the bark comprised one of the principal exports of the Bahamas, and could be purchased at the low rate of 10s. 6d. per cwt. He may therefore be presumed to have visited these islands towards the end of the last century. During my residence in New Providence in 1857–8, the prices ranged from nine to twelve shillings per cwt.; but at some periods, owing to the cessation of any demand, were almost nominal. The subjoined table, from official sources, will indicate the quantity exported from these islands from 1850–58, at the estimated value of £10. 10s. per ton.

	Tons.	Cwt:		Tons.	Cwt:
1850	46	3	1855	16	1
1851	50	4	1856	16	2
1852	10	13	1857	68	8
1853	24	13	1858	21	14
1854	25	15			

The parts of the plant employed for remedial purposes by the inhabitants of the Bahamas, are chiefly the cortex and tender shoots, which are administered in the form of a decoction or infusion, in cases of dyspepsia, loss of appetite, and other visceral derangements occurring as the sequel of acute endemic diseases. The leaves are selected chiefly to medicate their warm baths. Doubtless from being viewed more in the light of a mercantile product, than as a medicinal agent, it has of recent years fallen somewhat into disrepute, and is less frequently resorted to in the treatment of these maladies. It would not come within the scope of this paper to enter into the comprehensive details connected with the appliances of this drug in Europe. I may however remark, in addition to other uses, that I have found an infusion of the fresh bark, combined with ammonia or other stimulants, to prove of benefit in the latter stages of yellow fever, where, from the results of previous febrile excitement, the stomach has assumed an atonic or depraved condition, rendering it barely capable of exercising its ordinary functions.

II. The Jamaica, or Caribbean Cascarilla.

(*Croton Sloanei*, Benn.)

Mali folio arbor, artemisiæ odore et flore, *Sloane, Jamaica, vol.* ii. *p.* 30, *t.* 174, *fig.* 2.

Clutia Eluteria, *Linn. Amœnit. Academ., vol.* v. *p.* 411.

Croton fruticosum; foliis subrotundo-ovatis, subtus subincanis alternis, spicillis alaribus? *Browne, Hist. Jamaica, p.* 348.

Croton Eluteria, *Swartz, Flor. Ind. Oc., p.* 1183.

Croton Elutheria, *Wright, Lond. Med. Jour., vol.* viii. *p.* 3.

Cluytia Eluteria, *Woodville, Med. Botany*, 1 *ed., t.* 211, *f.* 1. *p.* 2.

Croton Eluteria, *Sw., Nees v. Esenbeck, Plantæ Medicinales, Band* 1.

Croton Eluteria, *Sw., Hayne, Getreue Darstellung und Beschreibung der in der Arzneykunde*, etc., *vol.* xiv. *t.* 1. *p.* 1.

Croton Eluteria, *Sw., Guibourt, Histoire Nat. des Drogues, ed.* 4. *vol.* ii. *p.* 340.

Croton Eleuteria, *Sw., Pereira, El. Mat. Medica, ed.* 4, *vol.* ii. *part* 1, *p.* 412.

Croton Eluteria, *Wood & Bache, Dispensatory of United States, ed.* 11, *p.* 198.

Croton Sloanei, *Benn. Journ. Proceed. Linn. Soc., vol.* iv. *p.* 30.

This plant appears to be indigenous to Jamaica, and has not hitherto been discovered in any of the Bahama islands. It was introduced into notice by Dr. Wright, who not only confounded it with the *Clutia Eluteria* of Linnæus (*C. Eluteria*, Benn.), but also stated that it constituted the source from whence the Cascarilla barks of the shops was obtained. His remarks are as follow: "This tree is common near the sea-shore, and rises to about twenty feet. The leaves are from two to three inches long and of a proportional breadth. On the upper side they are waved and of a rusty colour, on the under, ribbed and of a fine glossy or silvery appearance. From the axillæ they have numerous small spikes, with a great quantity of white, small, and fragrant flowers. The capsule is tricoccous like other Crotons. The bark is the same as the Cascarilla and Elutheria of the shops." Pereira, however, proved the fallacy of several of these statements; for on an examination of the customs entries, he ascertained these imports were brought from the Bahamas, and that the two supposed distinct barks retailed in the shops were in fact identical, and procured from the same plant. He also observed that two circumstances threw great doubt over the validity of Dr. Wright's conclusions: viz., that it was very unlikely that Cascarilla and Eluteria barks should be vended as distinct substances, if they were identical, and that it was possible they might be, or were nearly allied, but their identity was impossible; moreover if Cascarilla was the produce of *C. Eluteria*, how was it that none of the bark was imported from Jamaica, where, as Dr. Wright stated, the tree was very common? Nevertheless both this and the Bahama species (*C. Eluteria*, Benn.) were considered to be synonymous, by botanical and pharmaceutical authors until the present time.

Sloane, in his work on Jamaica, was the first to notice this plant under the descriptive outline of "Mali folio arbor, artemisiæ odore et flore," a dried specimen of which, exists in the Linnæan herbarium of the British Museum, in a good state of preservation. In the fifth volume of 'Amœnitates Academicæ,' Linnæus, under the same designation of *Clutia Eluteria*, confused it with the Bahama Cascarilla (*C. Eluteria*, Benn.): Swartz, in his 'Flor. Indiæ Occidentalis,' described the tree with ovate acuminate leaves, silvery beneath, and composite axillary racemes, by the name of *Croton Eluteria*, under the impression it furnished the ordinary bark of commerce; and this mistake has subsequently been continued in most of the works of Materia Medica.

Woodville, in the several editions of his 'Medical Botany,' gives a bad deli-

neation of both this and the Bahamian Cascarilla, evidently viewing them to be identical. Nees von Esenbeck, in his 'Plantæ Medicinales,' has also incorrectly stated this species to constitute the officinal Cascarilla bark. His figure has apparently been taken from the plant in the Herbarium of the British Museum. Hayne also, in his 'Arzneykunde,' adheres to the same mistake; and Pereira, in his elaborate work, labouring under the impression that Swartz's and the Bahama plants were identical, has also erroneously represented the former, with its connected descriptive details, as supplying the modern drug of the markets. Guibourt, in his 'Histoire des Drogues,' has also considered it to yield the same article.

This species, though commonly met with as a low bushy shrub, from 4–6 feet in height, often assumes an arborescent form, and attains an elevation of twenty feet or more. The trunk is more or less covered with a whitish wrinkled epidermis, as in the preceding plant. The leaves are petiolate, broadly ovate, blunt or with a blunt point, perforated with transparent dots, thinly sprinkled on the upper surface with peltate scales, beneath, more numerous, and of a whitish or silvery hue. A marked distinction may be observed in the character of the inflorescence compared with other species, the compound spikes, or rather racemes, being more frequently axillary than terminal, and densely clothed with small, subsessile, white, and fragrant flowers. The fruit consists of the usual tricoccous capsule, indicative of the genus, about the magnitude of a pea, each cell containing a small brown ovoid seed. The pericarp is minutely warted (Swartz), and studded with peltate scales. There are grounds for supposition, that the employment of the cortex of this plant by the colonists of Jamaica for various medicinal uses, may have led Dr. Wright into the belief that it was identical with the Cascarilla bark of the shops, and the warm aromatic taste and agreeable flavour of all parts of the shrub would tend to confirm this opinion. Although it is stated to be applied to the cure of disease, by the negro inhabitants of the island, I have not been able to obtain any detailed account of the mode of administration, or of the affections, for the treatment of which it is exhibited. I may observe that the plate of this Croton is taken from Dr. Wright's own specimen in the Herbarium of the British Museum.

III. The Smooth-leaved, or False Bahama Cascarilla.

(*Croton lucidum*, Linn.)

Croton fruticosum, *Miller, Gard. Dictionary.*

Croton lucidum, *Linn. Species Plant. n.* 1426; *Amœnitat. Acad., vol.* v. *p.* 410.

Croton spicatum, *Bergius, Philosophical Transact., vol.* lviii. *t.* 7. *p.* 132.

Croton erectum glabrum, foliis ovatis oppositis vel ternatis, spicis terminalibus, *Browne, Hist. Jamaica, p.* 347.

Croton lucidum, *Swartz, Flor. Ind. Oc., vol.* ii. *p.* 1193.

Croton (Astræopsis) Hookerianus, *Baillon, Euphorb. p.* 363.

Croton lucidus, *L. Grisebach, Flor. Brit. W. India Islands, vol.* i. *p.* 40.

In several of the districts of New Providence, the negro settlers were in the habit of collecting the cortex of this plant, with the object of boiling it with that of the *C. Eluteria*, Benn., under the notion it exerted a more favourable influence in the modification of its curative powers, and I found on inquiry that it was recognized by the specific term of *False sweetwood bark.* Elsewhere, however, these supposed remedial virtues are either apparently unknown, or not so much appreciated.

The species occurs in the Bahamas usually as a low dwarfish shrub, from 3 to 4 feet in height, and is common throughout the group, and in most of

the West India Islands. The stem is erect, with epidermis more or less stained by white or greyish rugous blotches, branches smooth or rarely lepidote, leaves long, petiolated (the petiole and midrib frequently of a pinkish hue), elliptical, perforated by transparent dots, with plain or slightly undulated margins, glabrous on upper surface, or sparingly covered with minute stellate hairy scales; devoid, beneath. Spikes abbreviated, simple, terminal, clothed with long petiolated white flowers, which emit a fragrant odour. They are produced in March and April, male and female on the same spike. The capsule is oblong, or ovate-oblong, partially embedded in persistent calyx, three celled, with a solitary seed in each. Pericarp glabrous, or sprinkled with a few stellate hairs. Seeds 2–2¼ lines long, ovoid oblong, pale-brown, shining, convex externally, with flattened sides. Fruit ripens about May or June.

The cortical layers of the bark are of a dull red colour, and in their fresh state have a slight bitter and somewhat astringent flavor; they are much less spicy and aromatic than the true Cascarilla. Under the preparation of a decoction it appears to be administered conjoined with that of the *C. Eluteria*, Benn., in cases of mild or ephemeral fevers, disorders of the chylopoietic viscera, and slight constitutional debility.

Fig. 1. *Croton Eluteria*, Benn, four-fifths of the natural size. 2. Portion of the arborescent form, six-sevenths of natural size. 3. Leaf of young plant, natural size. 4. Fruit, natural size. 5. Seeds, natural size. 6. Scale from leaf, magnified.

Fig. 1. *Croton Sloanei*, Benn., two-thirds of the natural size. 2. Portion of the inflorescence, magnified. 3. Scale from leaf, magnified.

(*To be continued.*)

MANUFACTURE OF CAUSTIC SODA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you allow me to correct an error in my paper on the 'Manufacture of Caustic Soda,' which appeared in the last number of your Journal.

At page 116, line 38 from top, the decomposition is represented thus:—

$$5NaS+4NaONO_5+4HO=5NaOSO_3+4N.$$

It should be—

$$5NaS+4NaONO_5+4HO=5NaOSO_3+4NaOHO+4N.$$

Yours, etc.,

A. Norman Tate.

79A, *Lord Street, Liverpool, Sept.* 8., 1862.

ON THE EXPLOSIBILITY OF PETROLEUM OIL.

BY A. NORMAN TATE, F.C.S.

The explosibility of the American rock-oils or petroleum is probably a subject of interest to many of the readers of the 'Pharmaceutical Journal,' as the oils are largely sold as lamp-oils, and as such, are dealt in by some Chemists and Druggists.

These oils give off at different temperatures an inflammable vapour, which forms with the air an explosive mixture. With one or two exceptions, all the crude oils as imported from America, that I have examined, gave off such vapour at ordinary temperatures, and must therefore be considered highly

Croton Eluteria. Benn

G. Jarman del. et sc.

Croton Hoffmei Benn.

dangerous. But I have lately examined several samples of the oils as sold for illuminating purposes, and have found that they exhibit a great difference in the temperature at which they give off inflammable vapour.

The following table shows the results I have obtained from the examination of twelve samples, purchased in Liverpool and Birkenhead:—

No. 1 evolved inflammable vapour at	87° Fahr.
2	120°
3	87°
4	135°
5	110°
6	90°
7	115°
8	96°
9	60°
10	140°
11	120°
12	100°

Of these samples not more than six can be considered perfectly safe: these are numbers 2, 4, 5, 7, 10, and 11. Number 9, which evolved inflammable vapour at as low a temperature as 60° Fahr., is highly dangerous; and numbers 1, 3, and 6, which yielded vapour at 87° and 90°, as they are liable to be exposed to such temperatures in lamp cisterns, must also be considered unsafe. The samples, numbers 8 and 12, explosive at 96° and 100°, may in most cases be put down as safe, for as a rule the temperature of lamp cisterns does not exceed 90° Fahr.; but under certain circumstances, to which it is possible a lamp may be exposed without being thought in danger, the cistern may become heated above 90°; therefore these samples (8 and 12) cannot in all cases be considerd safe.

It is much to be regretted that oils which yield inflammable vapour at lower temperatures than 100° Fahr. should be sold as lamp oils, as they are, without doubt, very dangerous, and accidents have already occurred from their use. The rock oils when properly refined (as for instance numbers 4 and 10 in the above table) may be used as lamp oils without any danger of explosion; they give a brilliant light, and their cost is so low as to bring them within the reach of the poorest classes.

With regard to the storing of the oils mentioned in the foregoing table (with the exception of number 9) no danger could arise from escape of vapour in any ordinary warehouse or storeroom, as the temperature of such places would certainly not rise as high as 87° Fahr. Such oils, however, as number 9, and the crude petroleum, should never be stored except in a thoroughly well ventilated place, so that the vapour evolved may not accumulate, but be carried rapidly away; and a lighted candle, lamp, etc., should on no account be allowed in the warehouse or store in which they are placed.

Laboratory, 79A, *Lord Street, Liverpool, Sept.* 8. 1862.

ON THE PROPOSED CHANGE OF WEIGHTS FOR THE NEW PHARMACOPŒIA.

TO THE EDITOR OF THE 'PHARMACEUTICAL JOURNAL.'

Sir,—I was in hopes that the proposed change of weights for the New Pharmacopœia was not to be disturbed, and that the principles on which the measure was founded had been fully vindicated by Dr. Charles Wilson, in

his paper in the 'Pharmaceutical Journal' for July, 1859. As, however, the question appears to be still under discussion, with at least a desire to disturb the proposed arrangement, I trust you will allow me space for a few remarks on the subject.

I will premise, that I think I may venture to say, that the feeling amongst Pharmaceutists in this quarter is universally in favour of the change, out and out.

I have no intention to view the question in its scientific bearings. I think it is not our business what may be the absolute value of the grain; our concern is with its value relative to the avoirdupois ounce and pound, which we all use. Now, the proposed change, by giving us a continuous divisible scale from a pound avoirdupois to a grain, would confer on us an important practical advantage, which we would all be sensible of, daily and hourly, in the constantly-recurring operations of the laboratory, and dispensing and retail counter.

I look on this as essentially a Druggist's question. The weights in the Pharmacopœia are ordered with a view especially, if not exclusively, for our guidance, and it is because we all use avoirdupois ounce and pound weights, transposing into this denomination the quantities expressed in troy, that a change is admitted to be necessary. Now, we will certainly continue to use these weights as long as they form the national standard, so that, if the quantities are indicated in hundreds or thousands of grains, as some propose, it will simply involve the trouble and risk of a new form of transposition into the avoirdupois. The partial change of the apothecaries' ounce and pound into avoirdupois, leaving the drachm as it is, would no doubt be an advantage. It would simplify operations where ounces and pounds only were ordered, but it would leave all the old inconvenience of an ounce divisible into $7\frac{1}{2}$ drachms (or thereby), experienced both in multiplying drachms into ounces, and dividing ounces into drachms. This difficulty, in some degree, will attach to any change into the avoirdupois, which falls short of the grain; so that we are brought at once to inquire, Is there really any sufficient objection to the altering of the grain too? Without entering narrowly into the merits of the question, does not the fact of the Dublin College having many years ago authorized the avoirdupois ounce and pound, and reduced the value of the drachm and scruple, even as is now proposed, show that there is really not the inconvenience and danger attached to a depreciation of value that is dreaded? It will be said the College stopped short of the grain. I grant the argument is not conclusive as to the grain specially, but I maintain that if there is such an objection as some seem to think, against the altering the grain, the Irish people must have felt the same objection in no inconsiderable degree, as applied to the scruple and drachm, which they have not. Or, to take a stronger instance, does not the fact of our apothecaries' measure having been based on the avoirdupois instead of the troy scale, down, be it observed, to the very minim or grain, which exactly corresponds with the proposed new grain, prove that the adaptation may be effected in solids as well? Further, may we not adduce the opinion of the advocates for a change of our measures to the troy standard (including the honoured name of the late Mr. Jacob Bell) in support of the practicability of the present change? the change they advocate being exactly the same in amount, viz. an eleventh, but with the aggravation of being to that extent *above*, instead of *below*, the existing standard. And, may we not add the important fact of the proposed change having received the approval of the three Pharmacopœia Committees, which, it must be presumed, comprise men who may be safely trusted as competent judges on this point, and who must have felt themselves peculiarly called upon to investigate it, in the course of their labours on the New Phar-

macopœia? Considering all this, I think we might expect to hear some very sufficient reasons before the proposal is set aside; reasons not confined exclusively to the objections that may be urged against it, but taking fairly into account the circumstances demanding or justifying the change, and the favourable opportunity of now effecting it. Such reasons would be far more satisfactory than the mere feeling against innovation, or than the alleged discrepancy between our grain as it would be, and the standard grain as scientific men would use it. Surely scientific men may safely assume what standard they please, for their position is different from ours in our relation to the medical profession, the public, and the general commerce of the country.

There are only two objections to the change as it affects us, and those I think of no serious character. First, it would necessitate the disuse of all our existing grain, scruple, and drachm weights, and the introduction of a new set. This I foresee no difficulty about. The demand would instantly cause a supply of the new weights, and every one would provide himself with them at once. It would only be necessary to have a distinctive mark on the new weights (at least for some time), say an "N," implying "New," or "Ph. B." for "Pharmacopœia Britannica." The other objection is the difficulty there would be in dispensing old prescriptions with the new weights; but this would surely be easily got over by keeping a set of the old weights for the purpose. I think too much has been made of this difficulty, considering that it would be so easily remediable, that it would be ever more and more lessening, and especially, that it would form only a very subordinate part of the far greater difficulty of dispensing old prescriptions with the preparations of the New Pharmacopœia, which must of necessity differ in many material points from the old.

I am, Sir, yours, etc.,

A Pharmaceutical Chemist.

Edinburgh, September, 1862.

THE USE OF METHYLATED SPIRIT IN PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I wish to join your other correspondents in protesting against this barbarous mixture. In your last number Mr. T. W. Gissing urges—"Either abolish the duty on pure spirit, and so place all men on a level, or stop the manufacture of methylated spirit." But as the spirit is *in no way* improved, but only injured by the process, the removal of the duty would stop the manufacture. I wish therefore to urge the latter part of the proposal *absolutely*.

In the 'Pharmaceutical Journal,' vol. xiv. pages 568 and 569, it is stated that methylated spirit is applicable to the manufacture of Fulminating Mercury, and the names of three persons are given, who had aided the professors in their inquiry. I know that *one* of those persons is a percussion-cap maker; and I wish to ask whether the public are in any way benefited by the materials of fire-arms being made a little cheaper.

Since the introduction of methylated spirit, fulminating mercury has been accumulated in such reckless quantities, that we have had several dreadful explosions in Birmingham, viz. in Whittal Street, in Graham Street, and in Legge Street, by which, taken altogether, upwards of fifty persons have been killed and wounded, and property destroyed.

The greater expense of pure spirit operated as a safe check before methylated spirit came into use, and fulminating mercury was prepared in smaller quantities.

Therefore, in this point of view, surely the public would be more benefited by reducing the income-tax than by abolishing the duty on spirit, or continuing the sale of methylated spirit.

Your correspondent Richard Reynolds has very ably described the injurious effect of methylated spirit on pharmaceutical preparations. I have pointed out another injurious effect of the same licentious mixture beyond the bounds of pharmacy, in order to urge, if possible, the absolute stoppage of its supply.

I am, yours respectfully,

JOSEPH LEAY, M.P.S.

335, *Icknield Street West, Birmingham.*

ON UNCLEAN SPIRITS, AND THE NATURAL ORDERS OF MEN.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—It will perhaps startle some of the naturalists who are numbered among your readers, to hear that the genus *Homo* is subdivided into a variety of natural orders. Those belonging to one very extensive order are characterized by their disposition to look after their own interests and leave other people to shift for themselves; a second are conspicuous from the remarkable fact that, with a limited number of fingers, we yet find their fingers in every pie. Both these orders are essential elements in the constitution of society, but it is to the latter that we are mainly indebted for the management of public affairs. *Homo officinalis*, if derived from the former order, is apt to do mischief or nothing; if selected from the latter, his active principles, when duly modified by cultivation, are of the greatest value. It is incumbent upon us all, whatsoever our position, to ask ourselves to which division our dispositions naturally tend, and to inquire whether our private or our public relationships do not call upon us to cultivate a little more of the one or the other character.

A few days ago, in conversation with a friend, the merits and demerits of the methylated spirit question were discussed, both agreeing that, taken as a whole, the use of methylated spirit was a pharmaceutical evil. Being allowed by the Excise, and disallowed by the Medical Council, there results a piece of debatable land, upon which the freebooter in trade finds it easy to appropriate to himself that which justly belongs to the nation, to his customers, or to his fellow-tradesmen.

On being called upon to take up my pen against this injustice, my first impulse was to say, "Let those shout who suffer. The evil has not yet come to Grey Street, and I have had no personal acquaintance with it." But such is just the line of policy which we who are out of office are apt to attribute to, and to condemn in, the Pharmaceutical Council. The evil has not reached Bloomsbury Square; it is not felt by those whose position enables them to sit in the council chamber; it is consequently scarcely acknowledged, and not sought to be remedied.

It is one of the true difficulties of office to distinguish between the whine of malcontents and the protestations of those who are really suffering an injustice; and when such difficulties arise, legislation based upon expediency should give way to that which is the offspring of higher principles. Though it is a degradation to speak of justice as policy at all, the best of policy being infinitely removed from honesty, honesty includes all that is to be gained by it. It is therefore as a matter of principle that I must advocate the entire abolition of methylated spirit from pharmaceutical use. It would probably

facilitate a solution of the question if those members of our society who come in contact with the various branches of the trade would express how far, as the result of their experience, the use of methylated spirit could be permitted without the risk of extensive infringement. I do not know any objection to the use of methylated ether and chloroform, and it would be a source of regret, that materials so valuable to the chemist and photographer should be interfered with. The use of methylated varnish, French polish, and polisher's finish is also probably unobjectionable; the risk in this case (which, however, is not great) being the recovery of the spirit by distillation; the evil coming to a climax in methylated spirit of nitre and tinctures for internal use. With the view of prohibiting the latter while permitting the former, we must advocate a thorough revision of the regulations, which it is to be hoped would result in some better arrangement than the present.

A considerable difference of opinion seems to exist about the extent to which the cleaning of methylated spirit is practicable. On the one hand we find that the cleaned spirit is still so far from being *clean*, that the tinctures prepared from it are not considered fit for the stomach of a respectable horse; while on the other, there are village shopkeepers and general practitioners who say, "What odds of the taste, as long as it is cheap?" and buy these selfsame tinctures for ordinary use. There consequently must be some class of patient animals into whose stomachs these questionable remedies find their way, and, whether they prove to be Quadrupeda or Bimana, I conceive it to be the duty of the Medical Council and the Council of the Pharmaceutical Society to protect them from the influence of these unclean spirits.

The honourable tradesman can only look upon the pharmaceutical use of methylated alcohol as a whited sepulchre, the wash over the outside of which does not make it clean, but only hides the rottenness and corruption within. The keen, money-making man, careless of doing his duty to his neighbour, is happy to find this opportunity of doing the exciseman and his duties at the same time.

I consider it no less the duty than the interest of all honourable men to brand with opprobrium the dealers in methylated tinctures, and let them feel the full weight of the word 'Brandee.'

It must not be supposed that the quiet conservatism of the Council is, like conserva rosæ, incapable of doing either good or harm to any one; let the occasion be made manifest and they will show their power, like conserva scammonii, to produce a pretty active movement through the body, sufficient to purge the trade from greater evils than those of which we now complain.

BARNARD S. PROCTOR.

Grey Street, Newcastle-on-Tyne, September, 1862.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

New Process for the Manufacture of Nitric Acid.—M. F. Kuhlman *fils* has recently shown that when nitrate of soda is heated with chloride of manganese, a mixture of nitrous acid and oxygen is disengaged, which, by passing through water, furnishes nitric acid; while common salt and a high oxide of manganese are at the same time formed. The decomposition of the two salts commences at a temperature

of about 230° Cent., and the heat has to be carefully maintained at that point. The reaction which then occurs may be thus expressed :—

$$5\,MnCl+(5\,NaO,NO_5)=Mn_5O_8+5\,NaCl+5\,NO_4+O_2.$$

The oxide of manganese produced may be regarded as a compound of 3 MnO_2 with 2 MnO.

The two salts are heated in a stone retort, and the mixture of peroxide of nitrogen and oxygen is passed through water contained in a series of vessels. The nitric acid is formed when the gases are brought into contact with the water, some binoxide of nitrogen being at the same time evolved, due to the excess of nitrous acid splitting up into nitric acid and nitric oxide. This binoxide coming into contact with the air in the condensing vessels, takes fresh oxygen, and is again absorbed. It is important, therefore, to avoid loss, to maintain a sufficient quantity of air in the arrangement.

M. Kuhlman has found, as the mean of a great number of operations, that 100 parts of nitrate of soda will furnish 125 to 126 parts of nitric acid of 35° strength. This yield closely approaches to that obtained by the ordinary process (127 to 128 per cent.). The oxide of manganese remaining after the reaction may be used for the generation of chlorine, by which it is again converted into chloride of manganese suitable for another operation.

Other chlorides, such as those of calcium, magnesium or zinc, are also capable of very definite decomposition by means of nitrate of soda ; chloride of sodium and an oxide of the metal being formed.

Sulphate of manganese also decomposes the nitrate, yielding the same products as the chloride, excepting that sulphate of soda replaces the common salt. The yield of nitric acid is practically the same. The reaction will also take place with sulphate of lime, but a high temperature is required: one hundred parts of nitrate of soda yielding by this treatment ninety parts of nitric acid of 35°. The residue consists of a mixture of sulphate of soda and lime.

M. Wœhler had previously indicated that a mixture of binoxide of manganese and nitrate of soda, when moderately heated, furnish no manganate, but a large quantity of caustic soda ; and even recommended the reaction as suitable for the preparation of caustic soda. M. Kuhlman has applied it to the manufacture of nitric acid. He finds the yield to be about the same as that obtained by the plaster of Paris method.

Black Oxychloride of Manganese.—M. Péan de Saint-Gilles has been engaged in studying the reaction between chloride of manganese and nitrate of soda, which occurs in the process of M. Kuhlman, described above. He finds that decomposition commences at about 220° Cent., and that, if the heat be maintained, the evolution of nitrous fumes continues for eight or ten hours. If the solid product of the reaction be washed until all soluble matter is removed, a black powder is obtained, presenting the appearance of peroxide of manganese. Analysis indicates, however, that it contains chlorine, and that it is really an oxychloride. The following are the results obtained :—

Manganese	63·8
Chlorine	11·3
Oxygen	23·5
Water	0·9
Loss	0·6
	100·0

These numbers yield the formula 3 Mn_2O_3MnCl. The analysis was confirmed by two or three processes :—

1st. By determining, by Gay-Lussac's chlorometric process, the quantity of free chlorine disengaged by the action of concentrated hydrochloric acid on the black oxychloride.

2ndly. By dissolving the oxychloride in water charged with sulphurous acid ; disengaging the excess of sulphurous acid, acidulating with nitric acid, and estimating the chlorine in the liquid as chloride of silver.

3rdly. By dissolving the oxychloride in hydrochloric acid, and estimating the manganese as red oxide, according to the ordinary method.

M. Péan de Saint-Gilles concludes from his experiments that the higher oxides of manganese are capable of retaining a very notable proportion of chloride in the insoluble state; and that when the oxide of manganese residual from M. Kuhlman's process, is employed for generating chlorine, this fact must be borne in mind, and the amount of acid necessary for its decomposition regulated accordingly.

Electro-Chemical Reduction of Metallic Cobalt, Nickel, etc.—MM. Becquerel and Ed. Becquerel have been engaged in studying the electro-chemical phenomena produced by electric currents of feeble intensity. They commenced by investigating the reduction of metals from certain solutions, and their results, in the case of cobalt, nickel, gold, silver, and platinum, have been published.

Cobalt.—This metal is obtained in a great state of purity by submitting to the action of a very feeble current a concentrated solution of chloride of cobalt, to which has been added a quantity of caustic ammonia or potash sufficient to neutralize any excess of acid. The metal is deposited in small coherent tubercles, or in uniform layers, according to the strength of the current. It is of a brilliant white colour, but a little resembling iron. During the decomposition part of the chlorine is disengaged, and part remains in the solution as hydrochloric acid. After a time the solution becomes very acid, and the metal loses its lustre and assumes a blackish aspect. This result is at once corrected by the addition of an alkali,—ammonia by preference. To obtain a coherent deposit, the intensity of the current must be regulated by the density of the liquid under decomposition. The cobalt obtained is hard and brittle; annealed at a suitable temperature in hydrogen gas, it becomes very malleable, and can be worked. Cylinders, bars, and medals may be readily obtained, by depositing the metal on suitable moulds.

Salts of lead and manganese, if present in the solution, are decomposed and deposited as peroxides on the positive electrode. Iron remains in the liquid, only traces being found in the deposited metal. The bars of cobalt taken from the solution are not only magnetic, but possess the polarity due to the action of the current or to that of the earth.

Nickel.—This metal is obtained by operating upon a solution of sulphate of nickel, any excess of acid being neutralized by ammonia. The sulphuric acid which is set free during the action may be neutralized by placing oxide of nickel at the bottom of the vessel, or by adding ammonia. In the first case, the solution remains at the same degree of concentration; in the second, it deposits clear green crystals of double sulphate of nickel and ammonia, very slightly soluble in water, but soluble in water containing ammonia. After a certain time a brilliant white metallic deposit is obtained, with a slight yellowish tinge. When taken out of the solution, and before being annealed, the metal possesses magnetic polarity, as in the case of cobalt.

Gold and Silver are readily deposited from neutral solutions without the intervention of any alkali. *Platinum* is obtained in the aggregated form with greater difficulty.

Estimation of Tartaric Acid.—The determination of the amount of tartaric acid contained in the mother-liquors from which it is prepared, offers to the manufacturer certain difficulties, on account of the number of foreign bodies with which it is mixed. M. Guido Schnister, having remarked that the acid tartrate of potash is almost insoluble in citric acid, has founded upon this property a method for the estimation of tartaric acid.

These mother-liquors ordinarily contain iron, alumina, magnesia, sulphuric acid, etc., and tartaric acid. To determine the amount of this last acid, the liquid is saturated with caustic potash or pure carbonate of potash, filtered to separate the metallic oxides which are precipitated, and an excess of citric acid added. The acid tartrate of potash is collected on a filter, washed with alcohol and weighed. One hundred parts of cream of tartar correspond to 79·9 of tartaric acid. The author has verified this process by several trials, and obtained correct results.

Action of Acetic Acid on Alloys of Lead and Tin.—In several works on Chemistry, it is stated that a bar of tin will precipitate lead from its solution, in the metallic state. This statement is made by Regnault in his *Cours Elémentaire de Chimie.* Proust has also remarked that lead, although soluble in acetic acid when pure, is com-

pletely insoluble when alloyed with tin. This subject being of some importance in a hygienic point of view, M. A. Pleischl has made some experiments for the purpose of more exactly determining the behaviour of lead under these circumstances. He finds that metallic tin is incapable of precipitating anything from either concentrated or dilute solutions of acetate or nitrate of lead; while, on the contrary, metallic lead throws down the whole of the tin from stannous nitrate. He also finds that the presence of tin in no way interferes with or retards the action of acetic acid upon lead. A number of vessels were made with alloys of lead and tin in different proportions—from 3 to 75 parts of lead with 100 of tin. Acetic acid of sp. gr. 1005 was allowed to stand in these vessels for twelve hours; in each case lead was afterwards found in the liquid, and quantitatively determined. It results therefore that the employment of pewter, solder, or other lead alloys, for vessels with which acid liquids come into contact, is highly dangerous.

Gilt Gingerbread.—The following paragraph appears in the last number of the *Répertoire de Chimie*. It is written by the editor, M. Ch. Barreswil, and relates to his recent visit to England.

"While taking a walk at Greenwich with M. Molet, the Persian Consul, I observed on the stalls of the hucksters some figures apparently made of some kind of gingerbread, and intended for children. These images were gilt over the entire surface, and it occurred to me that it would be interesting to ascertain the nature of this gilding, the price of the article being a sufficient indication that it was not real gold. I regret to state that the brilliant metal which covered these gilt cakes was false gold, consisting chiefly of copper. I have thought it right to publish this fact, because, notwithstanding the taste of the gingerbread was detestable, it is to be feared that children would be tempted to eat it, and undoubtedly the finely divided metal might cause serious accidents."

CASES OF POISONING FROM EATING THE SEEDS OF THE COMMON THORN-APPLE (*DATURA STRAMONIUM*).

Case I.

By Dr. Liégey, of Rambervilliers.

On the 3rd of September, 1861, about five o'clock in the evening, a woman living opposite to me, came into my surgery, holding in her arms a little girl aged two years and four months, who was crying, and was in an almost convulsive state of agitation; her body was covered with an erythrematous, or rather scarlatiniform blush, her skin was hot and dry, and her pulse febrile; this child was suffering from pain in the throat.

The child, although possessing but a very indifferent constitution, was generally healthy. At one o'clock of the same afternoon in which she was brought to my house, after having eaten with her usual appetite, she went out with her brother and sister, of the respective ages of six and four years old. About four o'clock her mother was told that she was ill on the road and could not walk, and the woman some minutes afterwards found her in the condition in which I saw her. Such was the only information this woman could give me, being, as she said, completely ignorant of what had passed from the time the child went out until the moment in which she had found her in the state just described.

I confess that, in the absence of any definite information, I never thought of the child having been poisoned; but at most I imagined at the moment that some foreign body had been arrested in the throat which caused the symptoms, or that some other cause produced local irritation, or that the child had been suddenly attacked with scarlatina.

I prescribed an emetic dose of ipecacuanha in lukewarm water, a weak aromatic infusion as a drink, rest in bed, and a low diet, and I desired the woman to send for me if the state of the little patient became more alarming. She did not send.

In the morning of the next day, as I was at the window, I saw a number of people before the abode of the woman who had brought the child to me on the day preceding. One person said, "She died from swallowing some poisonous seeds;" and another said,

"Look, here is the plant from which they were obtained." In this plant I recognised, at a distance, a stem of the *Datura Stramonium*.

The following particulars I afterwards learned:—An asthmatic person, living in an isolated house at the entrance of the town, cultivated the *Datura Stramonium* for its leaves, which he was in the habit of smoking for his complaint; he, not thinking that the fruits, covered with thorny protuberances, would prove any temptation to children, and supposing, moreover, that the seeds contained in them were altogether innocuous, because his fowls had always eaten them with impunity, he had this year, as in preceding ones, thrown the stalks, stripped of the leaves and the fruits, with their contained seeds, in front of his house, where they were intended to remain until they became dry enough for burning. On the 3rd of September, early in the afternoon, eight or ten children came to that place to play, amongst whom were the three children of the woman previously noticed. They divided the stalks, which were numerous, amongst themselves, and, unfortunately, also picked up the seeds and ate them, after having, as they said, made a kind of paste with some bread and water. The greater number of them vomited the poison immediately, and did not experience any further inconvenience of importance. It was thus with the eldest of the three children. The little boy, next in age, besides vomiting immediately after partaking of the poison, had also, during the succeeding night, an attack of delirium, which caused him to fall out of bed on his face, and, as a consequence of this, a very abundant bleeding from the nose. As for the youngest, who had not vomited (the one who had been brought to me), they gave it, as I had ordered, an ordinary emetic dose of ipecacuanha a short time after leaving my house; a long time elapsed, however, before vomiting took place, and when vomiting did occur, it was attended with great pain, and was repeated several times, and in the matter vomited they noticed a great number of the fatal seeds. The vomiting was also accompanied with diarrhœa; and the patient, after suffering from violent colic, was attacked with convulsions and delirium, followed ultimately by coma, which, towards three o'clock in the morning, terminated in death.

One of the children who partook of the poison, but not belonging to the family more especially noticed above, was, I am informed, seriously ill for a fortnight.—*Journal de Chimie Médicale.*

Case II.

By Dr. J. Larquet.

Although cases of poisoning by *Datura Stramonium* are by no means uncommon, it has appeared to me useful to call the attention of medical practitioners to the subject, at a time of the year when this plant, which is very common in some localities, excites, by the peculiarity of its flowers, and especially by its fruits, the attention, and sometimes the appetite, of children.

On Sunday, the 1st of September, about eleven o'clock at night, I was called to a neighbouring village to see a little girl, four years of age, who, I was told, had been ill for three or four hours. When I saw her, her cheeks were bright-red, her pulse very rapid, the pupils of her eyes in the highest possible state of dilatation, and her expression haggard and wandering. There was nothing abnormal with regard to her respiration. The child was insensible to the caresses as well as to the affectionate words of her mother. Her thirst was excessive, and she clasped convulsively the glass in which any drink was administered, when they desired to remove it from her. Her belly was swollen, her cries inarticulate, and the movement of all her limbs unrestrained. She was apparently suffering from some hallucinations, for sometimes her looks were fixed, and then her hands seemed as if pushing away a fanciful vision.

There were neither stools nor vomitings, and at times there were moments of repose. I learned that the child had come home about seven o'clock in the evening, after having played in the garden with one of her friends. When she was taking her meal the symptoms already described appeared, and from that time had continued to increase.

As this disease had commenced so suddenly, and more especially on account of the hallucinations and dilatation of the pupils, I thought of poisoning by Belladonna or Deadly Nightshade, as the cause of it; but on visiting the garden, as I could discover nothing but the *Datura Stramonium*, my opinion was fixed upon it. The friend of my

little patient, upon being questioned, said that when they went into the garden they had played at dining. The valves of the Stramonium capsule had been used as plates, and the seeds contained in them the child now ill had alone eaten.

An emetic was at once administered to my patient. In the matter vomited I could only find four or five Stramonium seeds. A purgative of croton oil concluded the treatment. After several stools the invalid slept a disturbed sleep the greater part of the following day, and on the day succeeding her health was completely re-established. —*Gazette des Hôpitaux, et Journal de Pharmacie et de Chimie.*

ROYAL INSTITUTION.

The "Friday evenings" of the Session at the Royal Institution were brought to a close on June 20th, by Mr. Faraday. The following is an abstract of the lecture :—

ON GAS FURNACES, ETC.

The subject of the evening was gas glass-furnaces, and having arisen almost extemporaneously, it resolved itself chiefly into an account of the manner in which Mr. Siemens has largely and practically applied gas, combined with the use of his heat regenerator, to the ignition of all kinds of great furnaces. Gas has been used to supply heat, even upon a very large scale, in some of the iron blast furnaces, and heat which has done work once has been carried back in part to the place from whence it came to repeat its service; but Mr. Siemens has combined these two points, and successfully applied them in a great variety of cases—as the potter's kiln—the enameller's furnace—the zinc-distilling furnace—the tube-welding furnace —the metal-melting furnace—the iron-puddling furnace—and the glass furnace, either for covered or open pots—so as to obtain the highest heat required over any extent of space, with great facility of management, and with great economy (one-half) of fuel. The glass furnace described had an area of 28 feet long and 14 feet wide, and contained eight open pots, each holding nearly two tons of material.

The gaseous fuel is obtained by the mutual action of coal, air, and water at a moderate red heat. A brick chamber, perhaps 6 feet by 12, and about 10 feet high, has one of its end walls converted into a fire grate; *i. e.* about halfway down it is a solid plate, and for the rest of the distance consists of strong horizontal plate bars where air enters; the whole being at an inclination such as that which the side of a heap of coals would naturally take. Coals are poured, through openings above, upon this combination of wall and grate, and being fired at the under-surface, they burn at the place where the air enters; but as the layer of coal is from 2 to 3 feet thick, various operations go on in those parts of the fuel which cannot burn for want of air. Thus the upper and cooler part of the coal produces a large body of hydrocarbons; the cinders or coke which are not volatilized, approach, in descending, towards the grate; that part which is nearest the grate burns with the entering air into carbonic acid, and the heat evolved ignites the mass above it; the carbonic acid, passing slowly through the ignited carbon, becomes converted into carbonic oxide, and mingles in the upper part of the chamber (or gas-producer) with the former hydrocarbons. The water, which is purposely introduced at the bottom of the arrangement, is first vaporized by the heat, and then decomposed by the ignited fuel and rearranged as hydrogen and carbonic oxide; and only the ashes of the coal are removed as solid matter from the chamber at the bottom of the fire-bars.

These mixed gases form the gaseous fuel. The nitrogen which entered with the air at the grate is mingled with them, constituting about a third of the whole volume. The gas rises up a large vertical tube for 12 or 15 feet, after which it proceeds horizontally for any required distance, and then descends to the heat-regenerator, through which it passes before it enters the furnaces. A regenerator is a chamber packed with fire-bricks, separated so as to allow of the free passage of air or gas between them. There are four placed under a furnace. The gas ascends through one of these cham-

bers, whilst air ascends through the neighbouring chamber, and both are conducted through passage outlets at one end of the furnace, where mingling they burn, producing the heat due to their chemical action. Passing onwards to the other end of the furnace, they (*i. e.* the combined gases) find precisely similar outlets down which they pass; and traversing the two remaining regenerators from above downwards, heat them intensely, especially the upper part, and so travel on in their cooled state to the shaft or chimney. Now the passages between the four regenerators and the gas and air are supplied with valves and deflecting plates, some of which are like four way-cocks in their action; so that by the use of a lever these regenerators and air-ways, which were carrying off the expended fuel, can in a moment be used for conducting air and gas into the furnace; and those which just before had served to carry air and gas into the furnace now take the burnt fuel away to the stack. It is to be observed, that the intensely heated flame which leaves the furnace for the stack always proceeds downwards through the regenerators, so that the upper part of them is most intensely ignited, keeping back, as it does, the intense heat; and so effectual are they in this action, that the gas which enters the stack to be cast into the air is not usually above 300°F. of heat. On the other hand, the entering gas and air always passes upwards through the regenerator, so that they attain a temperature equal to white heat before they meet in the furnace, and there add to the carried heat that due to their mutual chemical action. It is considered that when the furnace is in full order, the heat carried forward to be evolved by the chemical action of combustion is about 4000° whilst that carried back by the regenerators is about 3000°, making an intensity o power which, unless moderated on purpose, would fuse furnace and all exposed to its action.

Thus the regenerators are alternately heated and cooled by the outgoing and entering gas and air, and the time for the alternation is from half an hour to an hour, as observation may indicate. The motive power on the gas is of two kinds: a slight excess of pressure within is kept up from the gas-producer to the bottom of the regenerator, to prevent air entering and mingling with the fuel before it is burnt; but from the furnace, downwards through the regenerators, the advance of the heated medium is governed mainly by the draught in the tall stack, or chimney.

Great facility is afforded in the management of these furnaces. If, whilst glass is in the course of manufacture, an intense heat is required, an abundant supply of gas and air is given; when the glass is made, and the condition has to be reduced to working temperature, the quantity of fuel and air is reduced. If the combustion in the furnace is required to be gradual from end to end, the inlets of air and gas are placed more or less apart the one from the other. The gas is lighter than the air; and if a rapid evolution of heat is required, as in a short puddling furnace, the mouth of the gas inlet is placed below that of the air inlet; if the reverse is required, as in the long tube-welding furnace, the contrary arrangement is used. Sometimes, as in the enameller's furnace, which is a long muffle, it is requisite that the heat be greater at the door end of the muffle and furnace, because the goods, being put in and taken out at the same end, those which enter last and are withdrawn first, remain, of course, for a shorter time in the heat at that end; and though the fuel and air enters first at one end and then at the other, alternately, still the necessary difference of temperature is preserved by the adjustment of the apertures at those ends.

Not merely can the supply of gas and air to the furnace be governed by valves in the passages, but the very manufacture of the gas fuel itself can be diminished, or even stopped, by cutting off the supply of air to the grate of the gas-producer; and this is important, inasmuch as there is no gasometer to receive and preserve the aeriform fuel, for it proceeds at once to the furnaces.

Some of the furnaces have their contents open to the fuel and combustion, as in the puddling and metal-melting arrangements; others are enclosed, as in the muffle furnaces and the flint-glass furnaces. Because of the great cleanliness of the fuel, some of the glass furnaces, which before had closed pots, now have them open, with great advantage to the working and no detriment to the colour.

The economy in the fuel is esteemed practically as one-half, even when the same kind of coal is used either directly for the furnace or for the gas producer; but, as in the latter case, the most worthless kind can be employed—such as slack, etc., which

can be converted into a clean gaseous fuel at a distance from the place of the furnace,—so, many advantages seem to present themselves in this part of the arrangement.

It will be seen that the system depends, in a great measure, upon the intermediate production of carbonic oxide from coal, instead of the direct production of carbonic acid. Now, carbonic oxide is poisonous, and, indeed, both these gases are very deleterious. Carbonic acid must at last go into the atmosphere; but the carbonic oxide ceases to exist at the furnace, its time is short, and whilst existing it is confined on its way from the gas-producer to the furnace, where it becomes carbonic acid. No signs of harm from it have occurred, although its application has been made in thirty furnaces or more.

The following are some numbers that were used to convey general impressions to the audience. Carbon burnt perfectly into carbonic acid in a gas-producer would evolve about 4000° of heat; but, if burnt into carbonic oxide, it would evolve only 1200°. The carbonic oxide, in its fuel form, carries on with it the 2800° in chemical force, which it evolves when burning in the real furnace with a sufficient supply of air. The remaining 1200° are employed in the gas-producer in distilling hydrocarbons, decomposing water, etc. The whole mixed gaseous fuel can evolve about 4000° in the furnace, to which the regenerator can return about 3000° more.

AN ACT FOR THE SAFE KEEPING OF PETROLEUM.

(July 29, 1862.)

The Bill for the safe keeping of Petroleum, of which we gave an abstract in our July number, page 4, having now become law, we subjoin the *Act*, defining its provisions.

Whereas it is expedient to provide for the safe-keeping of Petroleum and certain products thereof that are dangerous to life and property, from their properties of giving off inflammable vapours at low temperatures: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. "Petroleum," for the purposes of this Act, shall include any product thereof that gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer: "Borough" shall in England mean any place for the time being subject to the provisions of the Act of the Session holden in the fifth and sixth years of King William the Fourth, chapter seventy-six, intituled "An Act to provide for the Regulation of Municipal Corporations in England and Wales; and in Scotland any royal burgh and any of the burghs or towns returning or contributing to return Members to Parliament; and in Ireland any place for the time being subject to the provisions of the Act of the Session holden in the third and fourth years of her Majesty, chapter one hundred and eight, intituled 'An Act for the Regulation of Municipal Corporations in Ireland:'" "Harbour" shall include any port, dock, navigable river, pier, or other works in or at which vessels ship or discharge goods or passengers: "Harbour Authority" shall include all persons or bodies of persons, corporate or unincorporate, being proprietors of or intrusted with the duty of improving, maintaining, or managing any harbour.

2. Every vessel carrying a cargo consisting wholly or in part of Petroleum, on entering any harbour within the United Kingdom, shall conform to such regulations in respect to the place at which she is to be moored as may from time to time be issued by the harbour authority having jurisdiction over such harbour. If any vessel is moored in any place in contravention of such regulations, the owner or master of such vessel shall incur a penalty not exceeding Twenty Pounds for each day during which the vessel remains moored, and it shall be lawful for the harbour master, or any other

person acting under the orders of the harbour authority, to cause such vessel to be removed, at the expense of the owner thereof, to such place as may be in conformity with the said regulations, and all expenses incurred in such removal may be recovered in the same manner in which penalties are hereby made recoverable.

3. From and after the first day of October one thousand eight hundred and sixty-two not more than forty gallons of Petroleum shall be kept within fifty yards of a dwelling house or of a building in which goods are stored, except in pursuance of a licence given by such local authority as is hereinafter mentioned. Any Petroleum kept in contravention of this Section shall be forfeited, and, in addition thereto, the occupier of the place in which such Petroleum is kept shall incur a penalty not exceeding Twenty Pounds a day for each day during which Petroleum is kept in contravention of this Act.

4. The following bodies shall respectively be the local authority to grant licences under this Act in the districts hereinafter mentioned; that is to say, (1.) In the City of London, except as hereinafter mentioned, the Court of Lord Mayor and Aldermen of the said city. (2.) In the Metropolis, as defined by the Act of the Session of the eighteenth and nineteenth years of the reign of her present Majesty, chapter one hundred and twenty, except the City of London, and except as hereinafter mentioned, the Metropolitan Board of Works. (3.) In any borough in England or Ireland, except as hereinafter mentioned, the Mayor, Aldermen, and Burgesses, by the Council. (4.) In any place in England or Ireland, except as hereinafter mentioned, within the jurisdiction of any trustees or improvement commissioners, appointed under the provisions of any local or general Act of Parliament, the trustees or commissioners. (5.) In any burgh or place in Scotland except as hereinafter mentioned, within the jurisdiction of any town council, and not subject to the jurisdiction of police commissioners or trustees, the town council; but in any burgh or place in Scotland, except as hereinafter mentioned, within the jurisdiction of police commissioners or trustees exercising the functions of police commissioners under any general or local Act, the police commissioners or trustees. (6.) In any harbour within the jurisdiction of a harbour authority, whether situate or not within the jurisdiction of any local authority, hereinbefore mentioned, the harbour authority, to the exclusion of any other local authority. (7.) In any place in England or Ireland in which there is no local authority, as hereinbefore defined, the justices in petty sessions assembled, and in Scotland any two justices of the peace for the county.

5. Licences in pursuance of this Act shall be valid if signed by two or more of the persons constituting the local authority, or executed in any other way in which other licences, if any, granted by such authority are executed; they may be granted for a limited time, and there may be annexed thereto any conditions as to renewal or otherwise which the local authority thinks necessary for diminishing the risk of damage from explosion or fire; and any licensee violating any of the conditions of his licence shall be deemed to be an unlicensed person.

6. If, on any application for a licence under this Act, the local authority refuses the licence, or grants the same only on conditions with which the applicant is dissatisfied, the local authority shall, if required by the applicant, certify in writing under the hand or hands of one or more of the persons constituting the local authority the grounds on which it refused the licence or annexed conditions to the grant thereof, and shall deliver the certificate to the applicant, who may thereupon, within ten days from the time of the delivery thereof, transmit the same to one of her Majesty's principal Secretaries of State, if the application is for a licence in England or Scotland, and to the Lord Lieutenant or other chief governor if the application is for a licence in Ireland, together with a memorial, praying that, notwithstanding such refusal, the licence may be granted, or that such conditions may not be imposed, or may be altered or modified in such a manner and to such extent as may be set forth in such memorial; and it shall be lawful for the Secretary of State, Lord Lieutenant, or other chief governor, if he think fit, on consideration of such memorial and certificate, and if he think it necessary or desirable, after due inquiry from and a report by such person as he may appoint for that purpose, to grant the licence prayed for, either absolutely, or with such conditions as he thinks fit, or to alter or modify the conditions imposed by the local authority; and the licence so granted, or altered and modified, as the case may

be, when certified under the hand of the said Secretary of State, Lord Lieutenant, or other chief governor, shall be to all intents as valid as if granted by the local authority.

7. Any forfeiture or penalty for an offence against this Act may be enforced in England or Ireland upon summary conviction before any two justices; and one moiety of the forfeiture and penalty shall belong to her Majesty, and the other moiety to the informer, unless the informer is a servant of the person informed against, in which case the moiety of the forfeiture or penalty which would otherwise belong to the informer shall be applied in such manner and to such other purposes as the justices in their or his discretion may think fit.

8. Any forfeiture or penalty for an offence against this Act may be enforced in Scotland upon summary conviction, at the instance of the Procurator Fiscal, before any sheriff, or before any two justices of the county, or before the magistrates or any police magistrate of the burgh in which the offence was committed, who may sentence the offender to imprisonment, until such forfeiture or penalty and the expenses of conviction are paid, for a period not exceeding three months; and one moiety of such forfeiture or penalty shall belong to her Majesty, and the other moiety shall be applied in such manner and to such purposes as such sheriff, justices, magistrates or magistrate in their or his discretion may think fit.

9. Petroleum may be searched for in the same manner, under the same warrants, and subject to the same conditions in, under, and subject to which Gunpowder may be searched for, in pursuance of the Act passed in the Session holden in the twenty-third and twenty-fourth years of the reign of her present Majesty, chapter one hundred and thirty-nine; and all the provisions of the said Act relating to searching for Gunpowder shall be incorporated with this Act, and be construed as if the word "Gunpowder" in such provisions included Petroleum as defined by this Act, and as if the Act therein referred to were this Act.

10. All powers given by this Act shall be deemed to be in addition to and not in derogation of any other powers conferred on any local authority by Act of Parliament, law, or custom, and the local authority may exercise such other powers in the same manner as if this Act had not passed; and nothing in this Act contained shall be deemed to exempt any person from any penalty to which he would otherwise be subject in respect of a nuisance.

REPORT OF THE COMMISSIONERS OF INLAND REVENUE.

In the Sixth Annual Report, addressed to the Lords of the Treasury, and dated the 15th of July, 1862, there is a Supplementary Report from W. G. Phillips, the Principal of the Inland Revenue Laboratory at Somerset House, which contains information that will be interesting to some of our readers, for whose benefit we insert it entire.

REPORT FROM THE PRINCIPAL OF THE LABORATORY.

The statement has sometimes been made that the Inland Revenue Laboratory is too circumscribed in its operations, and that its object is to protect the Revenue against the fraud of adulteration without regard to the welfare of the public. If, by this, it be meant that the Laboratory ought to take cognizance of all articles of consumption, whether subject to fiscal duties or not, the persons making such statement can have but a faint idea of the massiveness and inertia of the fraud they require to be assailed, and of the magnitude of the task they wish to impose.

It is true that the attention of my department is almost exclusively directed to matters which concern the Revenue; yet notwithstanding this limitation, the operations, to be effective, require to be on an extensive scale, as a Laboratory which is designed to contribute to the suppression or mitigation of adulteration, must, if it is to possess in any considerable degree both a detective and preventive action, make its influence felt by those who are disposed to adopt the obnoxious practice, for it is

not sufficient that such persons should know that punishment is nearly certain to follow detection; they should also be made to feel that immunity from detection is very precarious.

These considerations embody the principles upon which my department has always been conducted, and I believe that any method adopted for the suppression of adulteration will fail if not based upon similar principles. But the labour imposed on the Laboratory by the application of what may be termed the preventive system, although small when viewed in relation to the Revenue interests at stake, is, in the abstract, very great, as will be seen from the fact that during the last three years nearly 32,000 samples of that limited class of articles which are subject to Revenue duties, have been analysed in my department, any one of which might have given, and some of which did give, rise to prosecutions; whilst during the year just ended 11,431 samples were analysed, and 103 persons were, upon scientific evidence furnished by the Laboratory, prosecuted to conviction, the penalties imposed amounting to upwards of £3000. Thus, if it be necessary to adopt such an extensive system of analysis to prevent the adulteration of only a few articles of consumption, what must be the magnitude of that system which is designed to suppress the adulteration of all descriptions of food and beverages?

I have been led to dwell upon the foregoing topic by a conviction that the difficulty of dealing comprehensively with the practice of adulteration has been much underrated, and that the existing extent of the fraud will not be greatly diminished whilst the practice continues to be profitable to the producers and dealers, or until the consumers learn to apply the theorem that the value of a commodity is compounded of the price and the quality of the article.

The business performed in the Laboratory during the past year has been unprecedented in amount, and, as in previous years, many subjects of an exceptional nature, but more or less concerning the Revenue, have been referred to the department for investigation. Some of these subjects were interesting and of some importance, as for instance the allowing duty-free tobacco to be used in the "dipping" of sheep; others are only notable as illustrations of the objects of some projectors; thus, one person, with a view to a reward, submits specimens of writing in indelible ink, which ink is to render documents written with it, and postage-stamps cancelled by it, inviolable; when the writing is examined the ink is found to be one invented years ago, and to be most destructive to the materials upon which it is applied. Other persons propound a detailed and elaborate scheme for effectually suppressing the smuggling and adulteration of tobacco, the duty not to be levied by the Customs, but to be charged by means of a Revenue Stamp affixed to each package of the manufactured tobacco sold by retail; a process analogous to that used in securing the duty upon patent medicines; whilst, occasionally, preparations said to possess very valuable medicinal or other properties, and intended to be sold at a high price, have come under my notice, but which, when analysed, were almost invariably found to consist of well known and nearly costless materials.

Since the duty devolved upon my department of educating in chemistry a certain number of young officers yearly, twenty-nine students have been admitted, nineteen of whom have completed their course of instruction, and, with but one or two exceptions, passed with much credit through a severe and lengthened examination by Dr. Hofmann. The ten students at present in the Laboratory will, I think, be equally successful, as the results of the several examinations to which I have from time to time subjected them, in order to ascertain the rate of their progress and their relative merits, have been on the whole very satisfactory.

Within the past year 26 examiners have each received a month's instruction in the Laboratory, the total number so instructed, since the system was adopted in 1856, being 116, of whom 95 are now supervisors. The benefit which the Revenue derives from imparting to these officers a knowledge of the modes of detecting the usual forms of adulteration is now apparent, and it only remains to observe that the success of the system depends entirely upon the intelligence and zeal of the officers themselves.

The arrangements and discipline of the Laboratory were never better than they are at the present time; and that all who are employed in the department are kept fully occupied, is sufficiently proved by the amount of work which has been performed

during the past year, and the position which the students have taken at their examinations.

TOBACCO.

The quantity of tobacco annually cleared for home consumption having for many years been steadily increasing, it was natural to expect a further increase in the past year; the amount of tobacco, however, upon which duty was paid in 1861 was less by 436,395 lbs. or by 1·3 per cent. than that cleared in 1860, although it still considerably exceeded the quantity taken for home consumption in any other year. It is difficult at present to account for this falling off, which, however, is not improbably due mainly, if not wholly, to the depressed condition of the cotton manufacturing districts; some have ascribed it to an extension of the practice of adulteration, but to do so is to assume that this fraud has suddenly grown to very large dimensions, which, under the present system of supervision, it certainly could not have done without exciting the suspicions of the Revenue officers.

There can be no doubt that the importation of tobacco is in some degree checked by the constant efforts of the manufacturers, consequent upon the keen competition in the trade, to increase the amount of water introduced into cut tobacco, and an opinion exists in some quarters that, in order to prevent the tobacco from being spoiled by the presence of an undue proportion of water, recourse is had to some illicit substance possessing preservative properties. Such a practice may exist, but it can only be to a very slight extent, for, on a recent close inspection, made by experienced persons, of the whole of the tobacco manufactories in London, only one instance of fraud, and that not of the nature just adverted to, was discovered; whilst, in the months of August and September last, I visited a large proportion of the manufactories in the provinces without discovering anything to lead me to suppose that adulteration prevailed to more than its ordinary extent.

During the year just ended two manufacturers in Yorkshire were discovered to be adulterating their tobacco with rhubarb leaves; they, together with the person who supplied them with the leaves, were convicted of the offence, heavy penalties being imposed upon them. The illicit use of rhubarb leaves, although at one time common, is now but rarely attempted, as, since the general application of the microscope to Revenue purposes, the fraud cannot long escape detection. A few cases of the adulteration of roll tobacco with cabbage leaves have also been discovered in Scotland and Ireland.

TABLE showing the NUMBER OF SAMPLES of TOBACCO Analysed in the Laboratory, in the Years 1859, 1860, and 1861.

Years.	Number of Samples.		
	Genuine.	Adulterated.	Total.
1859 . . .	41	16	57
1860 . . .	25	5	30
1861 . . .	16	15	31

SNUFF.

The illicit sophistication of this article is now, I believe, less practised than it has been for many years, for whilst in 1856 the surveying officers sent to the Laboratory 209 samples of snuff, which they had reason to suppose were adulterated, and of which 110 were, on analysis, found to be so, during the past year only 20 suspected samples, 19 of which proved to be adulterated, have been forwarded to the Laboratory; and the force of this remark will be more apparent when it is mentioned that in the former year a few only of the officers were able, by analysis, to detect adulteration, whilst at the present time a great many are in possession both of the knowledge and appliances necessary for determining whether not only snuff, but many other substances liable to fiscal duties, are genuine or otherwise.

Some of the snuff manufacturers in Ireland have for many years been more prone to adulterate their goods than have the manufacturers in other parts of the kingdom, and

the readiness with which they have abandoned one adulterating ingredient when they have found that its character was known to the Revenue, and have adopted another, which they, no doubt from an imperfect knowledge of the powers of the microscope, trusted could not be detected, has occasionally been baffling for a time to my department.

The latest adulterant which has been employed is the ground acorn-cups of valonia oak. This substance is, in appearance, exactly the same as high-dried snuff, it being impossible, without chemical tests or the aid of the microscope, to prove any difference between the two.

During the past year six manufacturers in Ireland were convicted of adulterating their snuff with valonia, and heavy penalties were imposed upon them.

Although snuff is now but little adulterated with prohibited ingredients, it is still contaminated with other substances, such as alkaline salts and lime, to an extent which is not essential to the proper preparation of the article, and which constitutes a fraud on the public, and occasions, no doubt, a loss to the Revenue, whilst in some descriptions of snuff a large quantity of sand is introduced under the plea that such sand was imported with and had paid the same duty as the tobacco.

Samples of Snuff Analysed.

Years.	Number of Samples.		
	Genuine.	Adulterated.	Total.
1859 . . .	10	1	11
1860 . . .	7	3	10
1861 . . .	1	19	20

PEPPER.

That this commodity is still frequently adulterated is proved by the fact, that of 44 samples forwarded to my department for analysis during the past year, 19 were found to contain illicit ingredients. Thirteen of these samples were adulterated with ground rice; in one instance to the extent of sixty, and in another forty per cent. Four samples contained carbonate of magnesia, and of these one also contained five per cent. of ground coriander seeds. The two other samples were contaminated with about eleven per cent. of finely ground quartz.

Although the aggregate amount of illicit materials employed as adulterants probably at present bears a very small proportion to that of the pepper consumed, it may be inferred from the preceding results that this condiment can be sophisticated to the extent of from forty to sixty per cent. with a substance, such as rice, destitute of pungency, and yet be saleable; that if no means were in existence to prevent its being sold to the consumers in any other than a genuine state, the revenue derived from it would be much less than that which is now obtained; more especially as there are many pungent substances—which are cheap, and free from fiscal imposts—the presence of which in pepper, even in large proportions, would never be suspected by the public.

Samples of Pepper Analysed.

Years.	Number of Samples.		
	Genuine.	Adulterated.	Total.
1859 . . .	21	78	99
1860 . . .	47	24	71
1861 . . .	25	19	44

COFFEE.

During the past year 3045 samples of coffee and mixtures of chicory and coffee have been indiscriminately purchased for analysis from dealers in Great Britain, no

samples having been obtained from Ireland within the same period, as just before the close of the previous financial year a large number from that part of the kingdom was analysed. It may be presumed from the manner in which these samples were procured, and their number, that the results of their examination will show, approximately, the average proportion in which the dealers mix the chicory and coffee, which they illegally sell to the public both as mixtures and as pure coffee. The following table shows these proportions for the last three years, and also the percentage of illicit samples examined in the laboratory :—

In what Part of the United Kingdom purchased.	Samples purchased as Pure Coffee.						Samples purchased as Mixtures of Chicory and Coffee.					
	Percentage containing Chicory.			Average Percentage of Chicory in the Illicit Samples.			Percentage of Samples not labelled.			Average Percentage of Chicory in Mixtures not labelled.		
	1859.	1860.	1861.	1859.	1860.	1861.	1859.	1860.	1861.	1859.	1860.	1861.
England . . .	2·3	2·5	2·0	25·1	27·2	23·4	2·3	5·1	8·0	18·1	41·3	31·2
Scotland . . .	7·0	6·4	3·0	25·9	33·2	26·0	7·5	9·4	6·1	29·0	39·8	27·6
Ireland . . .	3·9	1·9	—	20·9	21·9	—	11·9	5·4	—	59·1	25·7	—
Total .	3·0	3·2	2·5	24·2	29·1	24·8	4·5	5·7	7·3	39·8	39·3	30·2

The number of samples examined in 1859, 1860, and 1861 was, respectively, 4212, 3876, and 3045, giving a total for three years of 11,133.

It would appear from the preceding results, that the proportion of chicory sold mixed with coffee, during the past year, was somewhat less than it was in the previous years; this can scarcely be accounted for by the increase of the duty on chicory to 8*s*. 6*d*. per cwt., which took place in June last, but it may be interesting to observe, at the close of the current year, whether the further increase of duty to 11*s*. per cwt., commencing on the 1st of April in this year, has produced any effect on the consumption of chicory sold mixed with coffee.

SAMPLES of COFFEE, and MIXTURES of CHICORY and COFFEE, examined in the year 1861.

In what Part of the United Kingdom purchased.	Samples purchased as Pure Coffee.					Samples purchased as Mixtures of Chicory and Coffee.					
	Number genuine.	Number containing Chicory.	Total.	Percentage of Samples containing Chicory.	Average Percentage of Chicory in the Samples.	Number properly labelled.	Number improperly labelled.	Number not labelled.	Total.	Percentage of Samples not labelled.	Average Percentage of Chicory in Samples not labelled.
England	1,196	25	1,221	2·0	23·4	527	2	46	575	8·0	31·2
Scotland	941	30	971	3·0	26·0	261	1	17	278	6·1	27·6
Ireland	—	—	—	—	—	—	—	—	—	—	—
Total in year 1861 .	2,137	55	2,192	2·5	24·8	788	2	63	853	7·3	30·2
,, ,, 1860 .	2,605	86	2,691	3·2	29·1	1,097	20	68	1,185	5·7	39·3
,, ,, 1859 .	3,365	105	3,470	3·0	24·2	693	15	34	742	4·5	39·8

I have, in my former reports, adverted to the evils, both fiscal and social, resulting from allowing coffee to be sold mixed with chicory, but as the practice has been permitted for many years, and has become universal in the trade, there might be much difficulty in suppressing it by legal enactments; for, if the dealer can derive a much larger profit from the sale of a pound of chicory than he can from a pound of coffee, he will, unquestionably, endeavour to force the former article into consumption to the

exclusion of the latter; and it is a question, whether both the public and the revenue would not be benefited by subjecting chicory to a duty which should countervail that imposed on coffee, thus greatly lessening that inducement which at present exists among dealers, to palm upon their customers adulterated coffee, under cover of legal regulations, framed solely to protect the consumers against fraud, and with the intention that the purchasers should always know whether they were buying genuine coffee or a mixture of coffee and chicory.

TEA.

Probably few articles are more generally adulterated than tea, particularly that which is sold as green tea. This sophistication, however, is, I believe, almost invariably effected before the commodity is imported; and this circumstance renders the fraud, when committed in this country, very difficult to prove by a mere analysis, which can only furnish presumptive evidence, as the tea can be easily adulterated so as to make it impossible to determine, positively, whether the offence was committed here or in China. The modes in which the Chinese adulterate the teas brought to this country are both ingenious and varied. The black teas often contain a very undue quantity of stalks, or pieces of very fine twigs, and seared leaves; others are mixed with a large proportion of leaves, which from their exhausted state have no doubt been used and re-dried in China; others again are much loaded with a very fine sand; whilst a favourite mode of adulteration is the adding to the tea from five to ten per cent., by weight, of very small fragments of quartz, which, by their having been made black by a coating of plumbago, are proved not to be adventitiously present. It may be observed, that the last two forms of adulteration are more adverse to the interests of the dealer than to the consumer, as the illicit substances, from their heavy gravity, will nearly all fall to the bottom of the dealers' canisters.

The remedy for the evil in question must be applied by the consumers themselves, for whilst they consider the price of tea, without sufficient regard to the quality, and give preference to those teas which possess a factitious colour and appearance, the evil will exist. In most cases there is no difficulty in determining whether tea is genuine or spurious. In black teas, a mere inspection, both before and after infusion, of the leaves and "dust," will generally show whether the specimen contains an undue amount of sand or other matters which are not vegetable, or leaves which do not possess the shape, the serrated edge, and the peculiar and delicate venation of the tea-leaf; the presence of exhausted tea-leaves can only be ascertained by a chemical analysis. If green tea has been coloured, it usually imparts a stain when rubbed upon white paper, and more readily when the paper is slightly damped; whilst the presence of those nodules which are made up of sand, gum, and "tea dust," so as to resemble "gunpowder" and "caper teas," and to which the name of "lie tea" has been given, may be easily detected by placing a small quantity of the sample in hot water, when the nodules will be seen to fall to pieces.

During the past year eighteen samples of tea have been examined in the laboratory, of these thirteen were adulterated, blackened fragments of quartz being present in every instance, whilst five samples contained in addition a large proportion of fine sand. One sample was adulterated to the extent of twenty-three per cent.; the average proportion of illicit materials in the thirteen samples being about seven per cent. Some of these samples were taken whilst the tea was in bond, and as the character of the adulteration was the same in the others, there can hardly be a doubt that they also were adulterated before being imported.

BEER AND HOPS.

Under this head only five samples, four of which were illicit, have been forwarded to the laboratory for analysis during the past year, whilst in the previous year forty-two samples, nineteen of which proved to be adulterated, were sent to my department. I am at a loss to account for this sudden reduction in the number of samples considered to require investigation; it may, however, be partly due to the salutary effect produced by the numerous convictions in 1860 of fraudulent brewers in the manufacturing districts of England, in which the adulteration of beer has for years been the most prevalent, and from whence the greatest proportion of illicit samples examined in my department has always been obtained.

MALT.

The prejudicial effects, not only on the revenue, but on the malting and brewing trades, resulting from the unprecedently bad condition of the barley grown in the year 1860, have now nearly ceased; and the samples of malt which have within the past few months been examined in the laboratory, show that the barley of last season's growth is uniformly healthy, and possesses in a high degree the power of germinating.

Notwithstanding the strong incentives which the malt roasters have to defraud the revenue, there is reason to believe that barley, which they at one time used to the almost entire exclusion of malt, is now but seldom roasted, and that this description of fraud, which for many years baffled all attempts to suppress it, is now, under the provisions of the Act 19 & 20 Viet. c. 34, brought within small and manageable limits; and this belief is confirmed by the fact that in the last six months of the year 1856, which were immediately subsequent to the passing of the Act mentioned, out of fifty-three samples taken from malt roasters, and examined in my department, fifty-one were illegal, and contained a mean of 71·6 per cent. of barley; whilst in the financial year just closed only thirteen illegal samples, containing a mean of 19·8 per cent. of ungerminated grain, have been analysed, and this difference is the more striking when the poor quality of the barley of the year 1860 is considered.

Samples of Malt examined in the Year 1861.	Number of Samples examined.
For remission of duty on the ground of defective germination . .	201
For exportation on drawback of duty	132
Taken from malt-roasters, and containing not more than five per cent. of ungerminated corns	—
Taken from malt-roasters, and containing more than five per cent. of ungerminated corns	13
Samples examined for other objects	36
Total number of samples examined in 1861	382
" " " 1860	754
" " " 1859	143

BEER EXPORTED ON DRAWBACK.

During the past year 7128 samples, representing 325,469 barrels of beer, have been examined, and 7544 distinct experiments have been made. On an average one sample has been examined for every forty-five barrels exported, whilst 1·36 per cent. of the beer was found not to be entitled to the drawback claimed, the corresponding percentage in 1860 being 0·99.

Owing to the representations of the brewers, the number of rates of drawback according to the strength of the beer exported has recently been increased from seven to eighteen, thus requiring that the quantity of malt consumed in the brewing of each barrel of beer should be determined to within less than one-fifth part of a bushel, a degree of nicety which a few years ago it would have been deemed impossible to attain.

WOOD NAPHTHA.

The propriety of permitting spirits of wine when mixed with wood naphtha to be used duty-free in the arts and manufactures, although for years generally acknowledged, has during the past year been subjected to very severe tests, and strenuous attempts have been made to show that the revenue is not only greatly endangered, but actually suffers to a considerable extent by a continuance of the permission. In my last Report I alluded to the fact that a person had submitted to my inspection a small quantity of tolerably pure spirits which he professed to have obtained from methylated spirits, and which he contended might be profitably prepared on a large scale; since then his process having become known, was found to be one which had been patented in 1845, and which was soon after abandoned, as being not practicable as a

commercial undertaking, it being very unwieldy in its nature, and requiring the use of stills, and its surreptitious application would be much more easily and certainly detected than the offence of ordinary illicit distillation; but independently of these considerations there are others of a more recondite nature, which alone would lead me to doubt that danger to the revenue would accrue from the process in question.

It is to be regretted that persistent attempts with a view to obtain an unjust advantage should be made to circumvent regulations which greatly benefit the community, and it would almost seem to be more a matter for congratulation than surprise that practicable means for defecating methylated spirits have not yet been discovered.

Notwithstanding the nauseous flavour and unwholesome nature of methylated spirits, a few instances of the sale as a beverage of such spirit when flavoured with essential oils have occurred within the year just ended; but this is a fraud which the now existing stringent regulations will, I think, be found sufficient to suppress, more especially as such a use of methylated spirit would be confined to that demoralized class of persons whose sense of taste is, through dissipation, greatly vitiated.

Since the month of January last no less than sixteen traders, chiefly druggists of respectable standing, have been convicted of selling methylated spirit without being licensed; the defence in nearly every case being that the spirit so sold was "finish," or spirit holding in solution not less that one ounce of gum resin to the gallon, and for the sale of which no licence is required; the bulk of the samples, however, were found on analysis to contain no resin, whilst the remainder contained only a very insufficient quantity.

During the year just ended one hundred and forty samples of wood spirit have been examined in the laboratory as to their fitness for methylating spirit, and their freedom from ordinary alcohol.

MISCELLANEOUS SAMPLES.

The number of samples of a miscellaneous description analysed in the laboratory within the past year is 182. Of these 37 consisted of British wines or sweets, 5 of foreign wine, 45 of methylated spirit and "finish," 30 of British spirits, and 11 of sugar, the remainder comprising fusil oil, pyroligneous acid, vegetable fibres, mosses, sheepwash, soap, and preserved milk.

TOTAL NUMBER of SAMPLES ANALYSED in the LABORATORY in each of the Years 1859, 1860, and 1861.

Description of Samples.	Number of Samples examined in		
	1859.	1860.	1861.
Tobacco	57	30	31
Snuff	11	10	20
Pepper	99	71	44
Beer, and substances used in its adulteration	6	26	4
Hops which have been used by brewers	6	16	1
Tea	5	4	18
Coffee	3,470	2,691	2,192
Mixtures of chicory and coffee	742	1,185	853
Malt	143	754	382
Beer (original gravities)	4,928	5,941	7,544
Distillers' wash	42	8	20
Wood spirit	47	57	140
Miscellaneous samples	75	154	182
	9,631	10,947	11,431

Inland Revenue Laboratory,
Somerset House, 31st March, 1862.

(Signed) G. PHILLIPS.

SCIENTIFIC BALLOON ASCENT.

Several balloon ascents have recently been made for scientific purposes by Mr. Glaisher, accompanied by, and under the guidance of, the celebrated aëronaut Mr. Coxwell. The most remarkable and one of the most eventful of these took place on Friday, the 5th of September. The day was capricious, being alternately fine and lowering, until finally, at the time of starting, an afternoon's rain seemed inevitable. The cords were loosed exactly at one o'clock, and the balloon coasted off in a south-westerly direction. The balloon, as on previous occasions, was not quite filled, on account of the expanding effects of the atmosphere at two or three miles' altitude. It contained 60,000 feet of excellent gas, prepared under the able superintendence of Mr. Proud, engineer to the gas-works. Some pigeons were on this occasion allowed to accompany the expedition. In addition to the instruments previously taken, Mr. Glaisher took with him a camera, in order, if possible, to take photographs of the different phases of the clouds. He also took a newly-invented barometer, for the purpose of securing more correct observations of the state of the atmosphere than was previously possible. These observations have formerly been taken by Gay-Lussac's siphon barometer and an aneroid; but as the correctness of the readings of the siphon barometer mainly depend upon having a perfectly calibred tube, and as the large size of the general barometer tube renders perfect calibration impossible, or at least very difficult, Messrs. Negretti and Zambra have constructed a barometer expressly for the purpose of checking the observations which have been made in order to test their correctness. With this view a good tube was selected, six feet in length, and the mercury boiled through the whole of that length. A cistern was then blown on its lower extremity, and a stopcock added, by which means the mercury was allowed to decrease inch by inch from the tube into the cistern, and the rise which took place in the cistern was subsequently accounted for in dividing the scale; the upper part of the tube was used to construct the barometer; and by this instrument a direct reading is obtained without any corrections being necessary for the displacement of the mercury in the cistern down to eight inches. The difference, if any be found, between this barometer and the Gay-Lussac siphon used in former ascents will be due to the inequalities in the tube of the latter. Among others, Lord Wrottesley was present when the ascent took place. The following interesting account of this ascent was furnished by Mr. Glaisher to the 'Times':—

TO THE EDITOR OF THE 'TIMES.'

Sir,—On the earth at 1h. 3m. the temperature of the air was 59°; at 1h. 13m., at the height of a mile, it was 39°; and shortly afterwards we entered a cloud, which was about 1100 feet in thickness, in which the temperature of the air fell to 36½°, and the wet-bulb thermometer read the same, showing the air here was saturated with moisture. On emerging from the cloud at 1h. 17m. we came into a flood of light, with a beautiful blue sky without a cloud above us, and a magnificent sea of cloud below; its surface being varied with endless hills, hillocks, mountain chains, and many snow-white masses rising from it. I here tried to take a view with the camera, but we were rising too rapidly and revolving too rapidly for me to do so; the flood of light, however, was so great that all I should have needed would have been a momentary exposure, as Dr. Hill Norris had kindly furnished me with extremely sensitive dry plates for the purpose.

When we attained the height of two miles, at 1h. 21m., the temperature had fallen to the freezing-point; we were three miles high at 1h. 28m., with a temperature of 18°; at 1h. 39m. we had reached four miles, and the temperature was 8°; in 10 minutes more we had reached the fifth mile, and the temperature of the air had passed below zero, and there read minus 2°; and at this point no dew was observed on Regnault's hygrometer when cooled down to minus 30°. Up to this time I had taken the observations with comfort. I had experienced no difficulty in breathing, while Mr. Coxwell, in consequence of the necessary exertion he had to make, had breathed with difficulty for some time. At 1h. 51m. the barometer read 11·05 inches, but which requires a subtractive correction of 0·25 inch, as found by comparison with Lord Wrottesley's standard barometer just before starting, both by his Lordship and myself, which

would reduce it to 10·8 inches, or at a height of about $5\frac{1}{4}$ miles. I read the dry bulb as minus five degrees; in endeavouring to read the wet bulb I could not see the column of mercury. I rubbed my eyes, then took a lens, and also failed. I then tried to read the other instruments, and found I could not do so, nor could I see the hands of the watch. I asked Mr. Coxwell to help me, and he said he must go into the ring, and he would when he came down. I endeavoured to reach some brandy which was lying on the table at about the distance of a foot from my hand, and found myself unable to do so. My sight became more dim; I looked at the barometer and saw it between 10 and 11 inches, and tried to record it, but I was unable to write. I then saw it at 10 inches, still decreasing fast, and just noted it in my book; its true reading therefore was at this time about $9\frac{3}{4}$ inches, implying a height of about $5\frac{3}{4}$ miles, as a change of an inch in the reading of the barometer at this elevation takes place on a change of height of about 2500 feet; I felt I was losing all power, and endeavoured to rouse myself by struggling and shaking. I attempted to speak, and found I had lost the power. I attempted to look at the barometer again; my head fell on one side. I struggled and got it right, and it fell on the other, and finally fell backwards. My arm, which had been resting on the table, fell down by my side. I saw Mr. Coxwell dimly in the ring. It became more misty, and finally dark, and I sank unconsciously as in sleep; this must have been about 1h. 54m.

I then heard Mr. Coxwell say, "What is the temperature? Take an observation; now try." But I could neither see, move, nor speak. I then heard him speak more emphatically, "Take an observation; now do try." I shortly afterwards opened my eyes, saw the instruments and Mr. Coxwell very dimly, and soon saw clearly and said to Mr. Coxwell, "I have been insensible;" and he replied, "You have, and I nearly." I recovered quickly, and Mr. Coxwell said, "I have lost the use of my hands; give me some brandy to bathe them." His hands were nearly black. I saw the temperature was still below zero, and the barometer reading 11 inches, but increasing quickly. I resumed my observations at 2h. 7m., recording the barometer reading 11·53 inches, and the temperature minus 2. I then found that the water in the vessel supplying the wet bulb thermometer, which I had by frequent disturbances kept from freezing, was one solid mass of ice. Mr Coxwell then told me that while in the ring he felt it piercingly cold, that hoar frost was all round the neck of the balloon, and on attempting to leave the ring he found his hands frozen, and he got down how he could; that he found me motionless, with a quiet and placid expression on the countenance. He spoke to me without eliciting a reply, and found I was insensible. He then said he felt insensibility was coming over himself, that he became anxious to open the valve, that his hands failed him, and that he seized the line between his teeth and pulled the valve open until the balloon took a turn downwards. This act is quite characteristic of Mr. Coxwell. I have never yet seen him without a ready means of meeting every difficulty as it has arisen, with a cool self-possession that has always left my mind perfectly easy and given to me every confidence in his judgment in the management of so large a balloon.

On asking Mr. Coxwell whether he had noticed the temperature, he said he could not, as the faces of the instruments were all towards me; but that he had noticed that the centre of the aneroid barometer, its blue hand, and a rope attached to the car, were in the same straight line. If so, the reading must have been between 7 and 8 inches. A height of six miles and a half corresponds to 8 inches. A delicate self-registering *minimum* thermometer read minus 12°, but unfortunately I did not read it till I was out of the car, and I cannot say that its index was not disturbed.

On descending, when the temperature rose to 17°, it was remarked as warm, and at 24° it was noted as very warm.

The temperature then gradually increased to $57\frac{1}{2}$° on reaching the earth. It was remarked that the sand was quite warm to the hand, and steam issued from it when it was discharged. Six pigeons were taken up. One was thrown out at the height of three miles; it extended its wings and dropped as a piece of paper. A second, at four miles, flew vigorously round and round, apparently taking a great dip each time. A third was thrown out between four and five miles, and it fell downwards. A fourth was thrown out at four miles when we were descending; it flew in a circle and shortly after alighted on the top of the balloon. The two remaining pigeons were brought down to the ground; one was found to be dead, and the other (a carrier) had attached

to its neck a note. It would not however leave, and when jerked off the finger returned to the hand. After a quarter of an hour it began to peck a piece of riband encircling its neck, and I then jerked it off my finger, and it flew round two or three times with vigour, and finally towards Wolverhampton. Not one, however, had returned there when I left on the afternoon of the 6th.

Too much praise cannot be given to Mr. Proud, the engineer of the gas-works, for the production of gas of such a light specific gravity.

It would seem from this ascent that five miles from the earth is very nearly the limit of human existence. It is possible, as the effect of each high ascent upon myself has been different, that on another occasion I might be able to go higher, and it is possible that some persons may be able to exist with less air and bear a greater degree of cold; but still I think that prudence would say to all, whenever the barometer reading falls as low as 11 inches, open the valve at once: the increased information to be obtained is not commensurate with the increased risk.

Sept. 9. JAMES GLAISHER.

THE AGE OF ENGLISH TREES.

Oaks and Yews, the most venerable of our trees, are, in several instances, so old that it is difficult to form an estimate of the time which has passed since they were planted. Several Oaks felled in Sherwood Forest, about a quarter of a century ago, exposed, on being sawn up, the date of 1212, and the mark or cipher of King John; and it has been calculated that these trees must have been several centuries old at the time the marks were made. It is well known that the Oak which is said to have proved fatal

> "To that Red King, who, while of yore,
> Through Boldre-wood the chase he led,
> By his loved huntsman's arrow bled,"

was standing, not long since, in the New Forest, in Hampshire: they who think this tree insufficient to record a fact of so ancient a date should be reminded that Sir Thomas Dick Lauder says, "Seven hundred years make no extraordinary period in the existence of an Oak: some Oaks blown down in Donnington Park were supposed by the interior rings to have been nearly 800 years old; and it is supposed, on good authority, that there still exist in England Oaks which were in existence at the commencement of the Christian era." A venerable Oak stood not long since at Tormond Wood, in Stirlingshire, under which, tradition says, William Wallace convened his followers. There are vestiges of the ancient Druids in the neighbourhood of this tree, which was 22 feet in circumference. There is another famous Scotch Oak called the Wallace Oak, at Ellerslie, near the place where Wallace was born. There are other Oaks in Great Britain which are probably more than 1000 years old. The most useful age of this tree, for building and other purposes, is from about 50 to 70 years. The oldest known Elm is said to have been that of Checquers, Buckinghamshire, and is supposed to have been planted in the reign of King Stephen. The Elm does not seem to live so long in the vicinity of towns as in the pure country air. Queen Elizabeth is said to have planted an Elm with her own hands at Chelsea; this was felled in 1745, and sold for a mere trifle. There are some fine trees of this kind in St. James's Park and Hyde Park: many of them have within the last dozen years suffered much by decay, storms of wind, etc. One of the Elms planted by Sir Francis Bacon, in the year 1600, in Gray's Inn, was felled in 1725, in consequence of its commencing to decay; it was then more than 28 feet 6 inches in circumference near the root. The Elms in the vicinity of the Metropolis are much worm-eaten.

The Mulberry seems to have been chiefly introduced into England by King James I., who was anxious to establish the culture of silk in this country. The King caused 10,000 Mulberry plants to be purchased and distributed throughout the country. They were delivered in London at the rate of three farthings each. The Mulberry tree said to have been planted by Shakspeare in New Place, was felled by the Rev. Francis Gastrell in 1756. Not longer than fifteen or sixteen years ago there were both Mulberry trees and Vines growing on the spot which had been used as the garden of the Priory of St. Bartholomew the Great, Smithfield.

In the days gone by, before firearms had put out of fashion the use of the bow,

the culture of the Yew was an important matter; but the growth of this tree was very slow, and the demand for wood of a tough, durable, and elastic nature, for bows, was so great, that the home supply of Yew wood was found insufficient: and merchants were for a long time obliged by law to import four staves with every ton of goods coming from places where bow-staves could be brought, and ten staves with every butt of Malmsey from Venice. When we consider the very slow growth of the Yew, and the large size to which some still in existence have grown, it seems probable that their age is not less than that of some of the famous British Oaks. Many have been recorded of the circumference of 26 feet, and there are some even larger than this. In Fotheringale churchyard, in Perthshire, is an old Yew, much shattered and nearly dead, the trunk of which measures 56 feet 6 inches in circumference.

The Maple, or Sycamore, often grows to a large size: one at Knowle, in Kent, was 12 or 14 feet in girth. The original plantations of Vauxhall and Marylebone Gardens were chiefly of the Great Maple. It is not considered to live to a great age; yet some have been noticed at Cambridge in a flourishing state at the age of 185 years. Before the use of crockery became so general as it is at present, the wood of the Maple-tree was common material for bowls and platters. It does not readily warp or splinter; it is, therefore, employed in making saddle-trees, founders' patterns, etc.

It is said that the two first Lime-trees which were planted in England (1590) are still growing at Halstead, in Kent. There is, however, much difference of opinion respecting the time of the introduction of this tree. This wood is much used by mould and other carvers. Gibbons, in the time of Charles II., decorated various important buildings with it. Many Lime-trees are more than a century old.

The Walnut-tree grows rapidly in England. There is a record of one of those trees growing in Scotland in the year 1684. It was more valuable before the extensive introduction of mahogany and other foreign woods than it is now. During the French war, the great demand for musket and pistol stocks thinned the Walnut-trees in this country. At that time so great was the demand for this timber, that a large sound tree has often been sold for £600, when cut into gunstocks.—*From the 'Builder.'*

POISONOUS PARTRIDGES.

In the 'Times' of Wednesday, September 10th, is a letter from Mr. F. Taylor, of Romsey, giving an account of some cases of poisoning by the flesh of Canadian partridges. It appears that in Canada, when the snow is on the ground, the birds are forced by hunger to feed on certain berries which render them unsafe for human food. What these berries are does not appear. Mr. Taylor's account of the poisonous effects produced is as follows:—

"On the 8th of last March I was sent for hurriedly to a lady who was described as dying. I found her cold, insensible, and pulseless. She had been sick while lying upon her back. I forced her to swallow a wineglassful of brandy, and took other measures for some hours to stimulate and recover the warmth and circulation, and partially succeeded. She remained, however, insensible, and almost in a hopeless state for many hours, at last gradually recovering, but for several weeks suffered from ill health in many ways. On regaining her consciousness, and during the whole of the following day, she experienced a most uncomfortable sensation of 'acute thrilling,' especially on the slightest movement of the muscles of the face. I suspected poison in this case, but I could not recognise the symptoms of any one poison in particular. I found that the lady had dined about two hours and a half previously to the attack, and that she had eaten part of one of these Canadian partridges. The birds were perfectly fresh, having been packed in ice. Five days after this occurrence I was sent for hurriedly to see a younger lady, the wife of a gentleman who had had a case of partridges sent him from Canada, and who had presented a brace of them to my first patient. I found this lady cold and pulseless, and feeling paralyzed, with 'a peculiarly horrid thrilling sensation all over her,' and a very painful sense of constriction in her throat. She had eaten for supper heartily of one of these Canadian partridges, and within a few minutes felt ill as I have described. I gave her mustard emetics, and afterwards brandy in large quantities; and gradually, after many hours of intense suffering, the lady recovered, and in a few days regained her usual good health. On the

night of her extreme illness, while sitting in the bedroom, I noticed a young cat there, which, in attempting to move, fell over on its side, and upon lifting it up I found the hinder legs paralysed, so as to be quite useless; and upon the poor thing attempting to walk or leap, it fell helplessly on its side again. The lady told me that during supper she had thrown to this cat some bits of the partridge. It was found that the poor thing had been thoroughly sick. The cat continued to be paralysed, but gradually recovered in a few days, no doubt saved by the natural act of vomiting. My impression is, that the younger lady might have recovered without help; but she was, I am certain, very materially benefited by induced sickness and by large doses of brandy. The elder lady, I feel sure, would have died unless prompt and continued strong measures had been taken to keep the flickering and almost exhausted flame of life burning."

It has long been known that the poisonous principles of certain plants retain their properties after having passed through the digestive laboratory and become incorporated in the tissues or secretions. Modern chemistry, by showing that the vegetable alkaloids pass through the animal body undecomposed, and may be detected under favourable circumstances, has only confirmed a very common observation. The flesh of hares which have browsed on the *Rhododendron chrysanthemum*, and that of young pheasants after feeding on the buds and shoots of the *Kalmia latifolia*, acquire deleterious properties. So also the milk and flesh of cattle grazing on some of the mountain herbage of South America have been found poisonous. Some time ago several persons near Toulouse were poisoned by a dish of snails, which had been fattened on the leaves and shoots of *Coriaria myrtifolia*. In all these instances the vegetable principles seem to be incapable of affecting the animals themselves. The poisonous effects of honey obtained by bees from certain species of Kalmia, Azalea, and Rhododendron, are also well known. It is said that the plague mentioned by Xenophon, from which the 10,000 Greeks suffered in their retreat, was produced by eating honey collected from the *Azalea Pontica*—the "Œgolethron" of the ancients. The effects produced by such honey are of a narcotico-irritant character, and in some instances have been of long duration. Even the mead made from it is highly poisonous. —*Med. Times and Gazette.*

Several letters have appeared in the public papers, without, however, throwing much light on the subject. In the 'Times' of Saturday, September 20th, Mr. Grantley F. Berkeley, in a letter to the editor, suggests that the birds in question may have been taken by poison, and that *strychnine* may have been adopted as the method of death. A letter has also appeared in the 'Times' from Mr. Attfield, who, with the hope of stimulating an investigation of the subject, has offered to make an analysis of any of the poisonous birds that may be sent to him for that purpose.—Ed. Ph. J.

ON THE DIGNITY OF ANCIENT PHARMACY.

BY M. DONOVAN, M.R.I.A., HON. MEM. OF THE PHILADELPHIA COLLEGE OF PHARMACY.

As the discovery of direct remedies for derangements of health would be the natural object of research amongst those who, in the infancy of society, interested themselves in the relief of human suffering, so pharmacy would be cultivated long before the slower process of investigating the nature of diseases, or distinguishing them.

Pharmacy is, therefore, the most ancient branch of the medical art. Were a proof required of the dignified position which it occupied in the early ages of the world, it would be found in the preservation of its records from remote antiquity; for its benefits were universal, and all mankind were interested in their perpetuation.

There are many historical proofs of the honour in which pharmacy was held; not only did the physicians of emperors invent and compound medicines, but emperors themselves; princesses addicted themselves to the same pursuits; nay, we find prophets and apostles occupied in compounding formulæ. A few of the more remarkable instances will sufficiently establish this point.

The Emperor Aurelius, on the death of Demetrius, appointed Galen to be the compounder of the celebrated Theriaca. Galen was held in the highest estimation by the Emperor, and the appointment was a token of his friendship; for so much venerated was the art which produced a medicine of such extraordinary, or, as it might well be

said, extravagant virtues as it was supposed to possess, that none were raised to the office of compounder but physicians of the highest reputation.

Avicenna was physician to the Sultan of Bokhara, and also his grand vizier; he was the companion of princes and nobles, the first physician of his day, and the great leviathan of philosophy in the universities of Europe. There is evidence that he compounded with his own hands.

Menecrates, physician to Tiberius, invented and prepared the celebrated diachylon —a plaster which has preserved an undiminished reputation for eighteen centuries, and will probably continue to do so for as many more.

Dioscorides of Anazarba, the great authority for materia medica for ages, was physician to Nero, or, as some think, to Anthony and Cleopatra. Antonius Musa, of celebrity inferior to few, was physician to Augustus, from which prince he received honours and many proofs of friendship, in return for his having saved his life in a dangerous disease. Pliny says the disease was inflammation of the bowels, but Suetonius calls it a disease of the liver. His practice is worth mentioning in this case. This celebrated physician prescribed lettuces, cold baths, and cold drinks!

Menecrates of Syracuse, the physician, friend, and intimate of Philip of Macedon, not content with the highest honours that could be conferred on him by his patron, assumed to himself the style and dignity of a god. He named himself Jupiter Menecrates, and appeared in public attended by an Apollo and an Æsculapius of his own creation. Philip, however, brought him to his senses by inviting him to a feast, where, while the other guests were enjoying the delicacies of the table, this new Jupiter was regaled with incense and perfumes at a side table. The god understood the hint, did not like the jest, and retired in confusion.

Democedes of Crotona was the intimate friend and constant guest of Darius the Great, and such were his talents that, from being an obscure person of indigent circumstances, he rose to the highest rank, and was the founder of the reputation of the medical faculty of Crotona. His history is curious, and a sketch of it will illustrate the treatment which medical practitioners sometimes experienced at the hands of power. The facts are related by Herodotus.

Democedes when young was compelled by the irritable temper of his father to leave his home and seek his fortune. He settled at Ægina, but was so poor as to be unable to procure the instruments necessary for his profession; yet such was his skill, and so great the character which resulted from it, that his income for the fourth year amounted in our money to nearly £1000. Polycrates, usurper of Samos, became his patron and retained him as his physician; but Polycrates, becoming an object of the unjust anger of Orœtes, governor of Sardis, was barbarously crucified by him, and Orœtes detained Democedes and others as slaves. Darius, disgusted at the crimes of Orœtes, caused him to be assassinated, and all his treasures and slaves, amongst whom was Democedes, to be brought to his capital. Darius one day, in the act of alighting from his horse after hunting, chanced to overstrain his ankle, and having some Egyptian physicians about him on whom he placed great reliance, he put himself under their care. These, however, according to the practice of their country, used rough measures with the limb, and twisted it about in such a manner as greatly to aggravate the injury. On the eighth day, the monarch having passed a restless night, and being in great pain, commanded Democedes to be brought before him, for he had been informed of his skill. The latter, found amongst the slaves, was led forward in his rags and fetters. He at first denied his skill, fearing that to avow it might cause his further detention. But Darius was not to be trifled with, and he ordered the doctor's faculties to be cleared by the application of whips and goads, the very naming of which induced Democedes to confess himself not quite so ignorant. In fine, by the application of mild remedies, according to the Grecian practice, which was in this instance opposed to that of Egypt, the ill effects of the previous violent measures subsided, and a complete cure was effected. As a reward for his services, he received from each of the wives of Darius a goblet full of gold pieces. He soon became possessed of a spacious house, lived in splendour, and was a constant guest at the king's table; but the Egyptian physicians were not forgotten: their ignorance excited the wrath of the monarch, and for the crime of being excelled in skill by a Greek, Darius was about to spit them on stakes of wood—a sentence which would certainly have been executed but for the in-

tercession of Democedes, who at length procured their pardon. A short time after, he proved equally successful with Atossa, the wife of Darius, who had a tumour in the breast, and having cured her she aided him in a stratagem, and he escaped to his native city Crotona, where he founded a school of medicine. Owing to the great talents of its founder, this school soon acquired a high character, and shed its lustre on the whole profession at Crotona, the physicians of which were at length considered throughout all Greece the most eminent of the faculty.

The crowned heads of antiquity personally devoted much of their attention to pharmacy, and contributed not a little to its *éclat*. A prince who had the welfare of his subjects at heart could not do better than encourage by precept and example the improvement of an art than which none ranks higher in point of utility to mankind.

We are informed by Josephus that King Solomon was celebrated for his knowledge of natural history. He spoke parables about beasts, birds, fishes, and trees, from the cedar to the hyssop that springs from the wall; of course their medicinal properties were the chief object of his study. When the celebrated Alexandrian Library was burnt during the siege of the city by Julius Cæsar, it is said that Solomon's 'History of Plants' fell a sacrifice to the flames, along with some fragments on magic. There is evidence that even before Solomon's time some of our most powerful and useful medicines were known, and their application in certain instances well understood. There is on record a prescription of those times, which is the earliest in the medical annals of the world, being 3000 years old. If we can rely on the testimony of Nicolaus Alexandrinus, who lived perhaps 1600 years ago, this prescription was originally compounded for no less a person than King David. From the little that can be collected on the subject, it would appear that the King had a consultation of physicians, and that they compounded for him a formula consisting of opium, aloes, saffron, lignum aloes, myrrh, and various spices, made into an electuary with honey. Amongst its enumerated virtues, we find that it relieves melancholy—a state of mind under which the royal psalmist seems in no small degree to have laboured at different times, and it is probable that nothing more effectual for procuring temporary relief could be produced in the present day than this most ancient prescription.

King Antiochus favoured the world with the invention of a supposed antidote to all sorts of poisons; for the despotic monarchs of antiquity seem to have lived in constant apprehension of the infusion of some mortal dose into their food. It consisted of some seeds and herbs, and instead of possessing the power of counteracting poisons, it could scarcely have had medical virtue of any kind. Absurd as its pretensions were, such was its attributed value that the prescription was engraved on stone at the entrance or most conspicuous part of the temple of Æsculapius. Antiochus prescribed it for his son, to whom he was exceedingly attached.

Attalus, the last King of Pergamus, famous for his knowledge of metallurgy, was also well skilled in medicine and pharmacy. He invented several medicines which acquired great celebrity, and compounded poisons and antidotes, the effects of which he proved upon sentenced criminals. Our present ointment of white lead, and some other formulæ which have descended to us, are of his invention. Marcellus has preserved the following prescription which this prince used to prescribe for diseases of the liver and spleen, for dropsy, and for improving a lurid complexion. It consists of crocus, nardus, indicum, cassia, cinnamon, myrrha, schœni flores et costus. These are to be made into a confection or electuary with honey, to be kept in a silver box. The King's knowledge of metals taught him that the medicine would be injured by any other readily procurable metal.

Mithridates, King of Pontus, perhaps invented the celebrated antidote called "confectio Mithridati;" but he might have improved it only, for some ancient authors think that the worthless secret was communicated to him by the physician Zopyrus. This may have been the same Zopyrus that compounded an antidote against mortal poison, and against pain in the stomach, liver, or spleen, for Ptolemy, King of Egypt, probably Lathyrus; it consisted of costus, thus masculum, piper album, flores junci rotundi, cinnamomum, cassia, crocus, myrrha et nardus, made into an electuary with honey. It was named "Ambrosia." It is related that certain criminals having been compelled to swallow poison, some got the Mithridate confection and recovered, while others who did not get it died. Avicenna seems to have believed that Mithridates

composed his antidote with his own hands; at least we may judge so from the emphatic language which he uses. He says: "Confectio Mithridati nobilis est confectio quam *fecit* Mithridates rex Ponti, et nominavit suo nomine, et *composuit* ipsam." The use of the words *fecit* and *composuit* in the same sentence seems emphatic. Mithridates dosed himself with this wonderful alexipharmic, but by constant use of it he became inconveniently poison-proof; for when he found it necessary to poison himself he could not, and was obliged to apply to a friend to stab him.

Juba the Second, the amiable and accomplished king of Mauritania, wrote books on natural history and on the virtue of herbs. Evax, a king of Arabia, wrote a book on medical botany, which he dedicated to Nero. Nero himself was a proficient in a branch of medicine which occasionally stood his friend. This imperial reprobate was in the habit of wandering about the streets of Rome at night in disguise, creating riots and committing all sorts of disturbances. He used on these occasions to get involved in pugilistic contests, during which he was often soundly thrashed, and seldom escaped without a black eye or two, and a face vying with the rainbow. Believing this was not a very reputable appearance for an emperor, he had the grace to keep by him in stock an ointment which he made of an acrimonious herb called thapsia, or deadly carrot, mixed with frankincense and wax. After these drubbings he smeared his face with his ointment, and next morning was quite free, as Pliny affirms, from all proofs of his well-merited punishment.

Agrippa, King of the Jews, invented an ointment for debility of the nerves, which encumbered the Pharmacopœias of Europe until a few centuries ago. It bore his name, and so much did this narrow-minded monarch prize his secret that he never could endure to communicate it to his subjects.

The Emperor Adrian is said to have possessed considerable knowledge of medicine and pharmacy, and he also favoured mankind with a royal antidote against all sorts of poison. It was called "Adrianum," and consisted of opium, henbane, euphorbium, and thirty-eight other ingredients of little power. The last royal medicine to which I shall allude is one composed in the sixth century by the Emperor Justin, which continued in use for nearly one thousand years.

The medical art was also understood and used for purposes which were not always the best, by princesses. From Diodorus Siculus we learn some historical facts, disguised in fable, it is true, but probably having reference to real persons and occurrences. Hecate, the daughter of Perses, studied the compounding of poisons, and was the discoverer of aconite, or wolfsbane. She made trial of every composition by mixing them with the food which was given to strangers; for it was the custom to destroy all strangers that came to or were cast on the island. Being thus grown skilful in the art, this accomplished lady poisoned her father and usurped his crown. According to Diodorus she had two daughters, named Circe and Medea. Circe was much addicted to the compounding of all sorts of medicines; she discovered the efficacy of various roots and herbs; learned much from her well practised mother, but much more by her own industry; so that, as Diodorus believed, she left nothing to be learned by any that came after her that could advance the art. She, imitating the example of her excellent mother, turned her skill to an equally good account, for she poisoned her husband and usurped his crown, but perpetrated so many cruelties on her subjects, that she was at length expelled the kingdom. Medea, however, turned her knowledge to humane purposes. (Diodor. Sic. cap. iii.)

Cleopatra, Queen of Egypt, wrote treatises on medicine, especially on the diseases of women. She made extensive experiments on poisons, and contrived various cosmetics, which in her own case she turned to good account.

Besides crowned heads, the profession of medicine enumerates in its list some of the most eminent philosophers of antiquity, who also invented and compounded remedies. Pythagoras and Democritus travelled all over Persia, Arabia, Ethiopia, and Egypt, and had conferred with the sages and learned persons called Magi; the great knowledge of medicine thus acquired they each presented to the world in the form of a book. Both of them publicly professed magic, but kept its mysteries secret. Pythagoras was certainly an extraordinary character; endowed with qualifications of the highest order, personal and mental, he commanded admiration and respect whenever he appeared. He was a celebrated wrestler, then a popular accomplishment, and

was skilled in oratory, rhetoric, poetry, music, and philosophy. On his return from his travels, he settled at Crotona, in Magna Græcia, where he founded a school, as well as a new sect of philosophers. His celebrated doctrine relative to transmigration, he, in all probability, purloined from the Egyptian priests; but it is certain that he supported it in a manner which he himself must have known to be false. He pretended that the soul of his deceased friend Calliphon conversed with him night and day, and gave him the important advice not to pass over a place where an ass had fallen down. On the whole, one would be disposed to consider this celebrated character as a highly talented and successful impostor. The following specimen of his pharmacy may be interesting. It was famed under the name of "Antidotum Pythagoras;" and we are informed that the great philosopher, having proved its efficacy, prescribed it for such of his dear friends as laboured under stomach complaints, in *all* kinds of which it is affirmed to be successful. "Recipe, Iridos drachmas octodecim et scrupulos duos; gentianæ drachmas quinque; zingiberis drachmas quatuor cum semisse; melano-piperis drachmas quatuor; mellis s.q. Detur in modum nucis." Pythagoras also invented vinegar of squill; but the medical use of the squill was taught him by Epimenides.

Empedocles of Agrigentum, a philosopher and an eminent poet, was celebrated for his knowledge of medicine. Of such consideration was he amongst his countrymen for his talents and social virtues, that they offered him the crown, but this proof of their affection he had the magnanimity to refuse. He was a believer in a modified doctrine of transmigration: according to his own account he had been a girl, a shrub, a fish, and finally, a philosopher. Could he have sincerely believed this?

Democritus, who had travelled to the same countries as Pythagoras in search of knowledge, seems to have been an equally eccentric genius; and such were his peculiarities that he was at one time supposed to be mad. He seems to have had a taste for chemistry; for he found solvents for different stones, made artificial gems and coloured them with metallic oxides, and invented an atomic hypothesis, which, however, had little resemblance to that at present known. The following is one of his prescriptions; it does not evince much skill in the selection of remedies:—Take the spinal marrow of a hyæna, mix it with his gall and some old oil, and boil them all together. It was employed for all pains of the nerves. (Marcellus.) In the book written after his travels, he has given a prescription which inevitably leaves him in the dilemma of being accounted either a most credulous fool or a consummate knave. It is a composition which enables a man to have handsome, virtuous, and fortunate children. (Pliny.) Miserably for the votaries of beauty, the prescription is lost. The characteristics of the ancient physicians is the attributing of inordinate powers and too many virtues to inconsiderable remedies. Chrysippus and Dienches each wrote a book, wonderful to say, on the medical virtues of cabbage. (Pliny, Galen.)

I shall give but two or three more instances of illustrious persons of ancient times who occupied themselves with the practice of pharmacy. The prophet Esdras, while in exile at Babylon, amused himself with compounding a medicine of his invention, which, up to a few centuries since, retained a place in the pharmacopœias of Europe. It consisted of no less than 150 ingredients, and one of these consisted of forty; out of which number the prophet calculated that one at least should be capable of curing. He might have shortened his prescription and his labours by directing a little of all the medicines known in the world at that time to be mixed together. Those who wish to compound this polychrest formula of 190 ingredients will find it in full detail in the work of Nicolaus Præpositus.

It is not perhaps generally known that St. Paul was an amateur in physic; yet Nicolaus Præpositus gives a formula which he calls Potio Sancti Pauli, and which, he says, was invented by that learned apostle. It is the same heterogeneous medley as all the medical prescriptions of that age. St. Luke, as is well known, was a physician; but I have not been able to gain any insight into his practice.

On consideration of this list of emperors, princesses, philosophers, physicians-royal, prophets, and saints, who have in different ages of the world pursued the knowledge of medicine combined with pharmacy, we cannot fail to be struck with the antiquity and grandeur of the art, as it was then practised—a noble art cultivated for its own sake, without fee, but not without reward—as a branch of philosophy, and as an element of liberal education.—*Dublin Medical Press.*

ON POISONING WITH UPAS TIEUTÉ.

Some time ago, a gentleman of Berlin, who is well known for his scientific ardour, received from Java a somewhat considerable quantity of the arrow-poison, upas ticuté, with which he determined to make experiments concerning its action in the animal economy. A more cautious or less enthusiastic person would probably have commenced his investigations on frogs or rabbits, but Dr. ——— at once fearlessly subjected himself (or, as the Americans would say, "his own precious body") to the action of the poison. One afternoon he took three grains of the substance, which he found to have a very bitter and slightly saline taste. After having swallowed it, the doctor felt more cheerful, and a headache which he had had passed off; on the other hand, a feeling of heaviness in the stomach supervened. He soon afterwards left his rooms and went out; and the first sign of the action of the poison having begun, was that, on turning round the corner of a street and feeling a strong wind, he perceived a sort of stretching all along the spine. This was half an hour after he had taken the poison. An hour afterwards, on being about to take a cup of coffee, he suddenly felt a violent concussion of the whole body, succeeded by powerful stretchings of all the extremities; at the same time the head was drawn backwards. He endeavoured to speak, but could not open his mouth. This paroxysm soon ceased, but others followed rapidly, either spontaneously or after the slightest stimulus. Consciousness was not in the least disturbed. The fits were not painful, the respiration was not impeded, and the muscles remained quite flaccid after the fits. Swallowing was difficult, and the patient felt very weak. He then desired to be brought to the Charité Hospital, and on being carried downstairs violent spasms came on; while in the cab which took him to the hospital, he was quite free from them. He was transferred to the *clinique* of Professor Frerichs, where ipecacuanha and tartar emetic were at once given, as it was supposed that part of the poison might still be in the stomach. Copious vomiting ensued, accompanied by tetanic convulsions, spasm of the glottis, and dyspnœa; but the latter ceased with the vomiting. Further convulsive fits followed, either spontaneously, or on touching the patient's body or the bed, or on suddenly directing a light to the eye. The pulse was at 72, and there were no other morbid symptoms. The patient now took ten drops of laudanum every quarter of an hour, and after three such doses, he took fifteen drops every half-hour. Having thus altogether taken sixty drops, he fell asleep. He perspired freely, and was repeatedly awakened by tension and convulsions of the muscles of the neck and the back; but on taking a few more drops, he soon fell asleep again, and remained so for twelve hours. On awakening the next morning, he felt exceedingly weak; there was still some stretching in the muscles of the left side of the neck, but no spasms. The pulse was at 66. Swallowing was still impeded, and the urine passed off with difficulty. This was found to contain strychnia. The laudanum was then discontinued, and the patient merely took wine and easily digestible food. On the third day he was able to leave his bed, and on the sixth his health was quite re-established.

The poison was subjected to examination in the chemical laboratory connected with the hospital. It was contained in a piece of bamboo-cane, and consisted of a coarse-grained reddish-brown substance, in which several shining crystals were seen. On putting some of it under the microscope, amorphous grains and small tetrahedral crystals were discovered. A small trace of this substance gave a strong reaction of strychnia, and it was found that in a hundred parts of upas, sixty-two parts of pure strychnia were contained, so that the three grains of upas taken by the doctor were equivalent to about a grain and three-quarters of strychnia. Frogs and a dog, to which some of the poison was given, died in a short time. If woorara had been at hand, it would probably have been administered to the patient; although, on the whole, Professor Frerichs is disinclined to try it on patients, as we have until now no certain data as to the doses in which this powerful drug should be given. The effects of opium were in this case certainly very satisfactory.—*Medical Times.*

ON THE USEFUL PLANTS OF PARAGUAY.

BY DOMINGO PARODI.*

(*Concluded from Vol. III. p.* 274.)

Maní-grande, Manduví-guazú (Guarani); ?*Moronobea coccinea*, Aubl. (*Guttiferæ*), a large tree, the seeds of which are the size of a hazel-nut and are eaten toasted. From incisions in the trunk, a yellow resin is obtainable, which, if our botanical reference is correct, should be the *Résine de Mani* of Guibourt.

Mechoacan (Guar.); *Ipomæa Pisonis, I. operculata* (*Convolvulaceæ*); *Batata purgante.* The root of this plant consists of a large tuber of five to six inches diameter, internally whitish and farinaceous; it possesses energetic purgative properties, which are due to the resinous principle it contains, and which may be easily separated by treating the powdered root with alcohol.

Natiuná (Guar.); *Nigella* sp. (*Ranunculaceæ*). Its blackish aromatic seeds are sometimes used internally as a stimulant.

Natiuná (Guar.); *Vallico* (Span.); *Lolium* sp. (*Gramineæ*).

Nuatí (Guar.); *Trebol de los prados* (Span.); *Trifolium* sp. (*Leguminosæ*).

Nandipá (Guar.); *Genipa americana* L. (*Rubiaceæ*). A tree of regular shape, the resinous wood of which is used for cases for fire-arms, for boards, posts, etc. It is said that from incisions in the trunk a resinous substance flows, which, when dissolved in alcohol, constitutes a good varnish. The fruit is of the size and shape of a lemon, and is fleshy; it contains a whitish pulp with numerous seeds, and is edible, though but little agreeable in flavour. The fruit, macerated in alcohol, yields a resinous matter of an intense blue, which is a permanent dye for textile fabrics. With a persalt of iron, a brilliant and firm black is obtained. The Indians use the colour of this fruit in rendering indelible the tatooed designs upon their faces and arms.

Nandubay (Guar.); *Acacia Cavenia* (*Leguminosæ*). A small tree of eighteen to twenty-four feet high, with a crooked, knotty trunk. The wood, being excessively hard and irregular to work, is used for palings and fuel. The *Espinillo* is a species of *Acacia* with golden-yellow fragrant flowers.

Natinguí (Guar.); *Higuera silvestre* (Span.); *Ficus* sp. A variety or species very near *F. Ibapohy.*

Nuatí-curuzú (Guar.); *Espina de la Cruz* (*Myrtaceæ*), a spiny shrub, the seeds of which are surrounded by a blackish aril, having the appearance and taste of the pulp of *Cassia fistula.*

Obechayú (Guar.); *Ajonjera* (Span.); *Carlina* sp. (*Compositæ*).

Obechayú (Guar.); *Cepa Caballo* (Span.); *Eryngium* sp. (*Umbelliferæ*). Grows in the vicinity of habitations; bitterish astringent root, used in liver complaints.

Paraparay-mi (Guar.); *Euphorbiaceæ.* Small plant with milky juice; decoction, a popular remedy as a detersive wash for ulcers of cancerous aspect.

Paraparay-guazú (Guar.); *Tecoma* sp. (*Bignoniaceæ*). Leaves and bark reputed antisyphilitic, but their virtues probably due to their astringency. Another plant of the same Order (*Bignonia?*) is employed as a diuretic and deobstruent, and is particularly reputed as a specific in *bubo.* The extract of the leaves is bitter and very astringent.

Paraparay (Guar.); *Roble negro* (Span.); *Schinus* sp. (*Terebinthaceæ*). Chronic diarrhœa and dysentery are treated successfully with a decoction of the astringent balsamic bark; reputed to be highly efficacious also in cutaneous complaints. The decoctions for internal use are prepared from the leaves, and the balsam as a topical application, from the bark and leaves, boiled successively in wine.

Pacurí (*Apocyneæ?*). An edible berry, with a white, pleasantly acid pulp. Tree lofty with entire, dull green; shining leaves, and a yellow milky juice.

Paraiso (Guar.); *Melia Azedarach* (*Meliaceæ*). Leaves, bark, and fruit highly purgative and anthelmintic, but not used, being considered dangerous.

Pindó. A palm with an edible fruit resembling the date.

Pirí-mi, Pirí-guazú, Pinó-mí, Pinó-guazú (Guar.); *Ortiga, Ortiga grande* (Span.);

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* Revista Farmaceutica de Buenos Ayres. July, 1861.

Urtica sp. Cortical fibres are worked into fine strong thread, from which various textile fabrics are made, chiefly by the Indians. The first three Guarani names are also applied to a species of *Cyperus*.

Pinó (Guar.) ; *Pinon purgante* (Span.) ; *Jatropha Curcas*. Oily seeds a violent drastic, though less energetic than those of *Croton Tiglium*.

Pirí-ibabó-iacabaé (Guar.) ; *Juncia olorosa* (Span.) ; *Cyperus* sp.

Pacobá (Guar.) ; *Banano* (Span.) ; *Musa paradisaica*, *M. Sapientum*.

Pipí (Guar.) ; *Petiveria alliacea*. The part of this plant most used is the root, which has an acrid, alliaceous taste, and a strong, disagreeable odour. It is regarded as diuretic and anthelmintic, as well as febrifuge, but it is more frequently applied externally, either as a fomentation or cataplasm, in cases of paralysis, rheumatism, pains of the joints, etc.

Pety (Guar.) ; *Tabaco* (Span.) ; *Nicotiana* sp. Various species of tobacco are cultivated, their leaves constituting one of the most important exports of the country.

Palo santo negro, *Guayaco*. *Guaicum* sp. A decoction of this wood and the root of an *Aristolochia*, is reputed efficacious in venereal complaints, also in chronic dysentery, asthma, exanthema, etc. A concentrated decoction of the wood applied to the head as a wash two or three times a day, is said to cure scurfy herpes of the scalp and tinea. The use of the wood as timber is well known.

Piña silvestre, *Ananás silvestre* (*Bromeliaceæ*). A small species of pine-apple growing spontaneously in the fields ; its fruit is agreeably sweet and aromatic.

Quebracho (*Apocyneæ*). Two varieties, the white and red ; the wood of each is very durable and useful for axles, rollers of sugar-mills, etc.

Quinó-quino ; Myrospermum sp. (*Leguminosæ*). The fruit of this tree is a small flattened, membranous legume, containing a single rugose, reniform seed, of balsamic odour, used as a remedy for headache, half a seed being applied to each temple. The bark of the trunk is impregnated with a resinous balsamic juice, having the odour of melilot ; it is used in decoction and in powder to promote the cicatrization of ulcers and wounds. From incisions in the trunk of the tree a dark-brown resin is obtained, which appears in no respect to differ from dry balsam of Peru. The wood, which is aromatic, hard, and compact, is used for furniture, under the name of *Palo de Trebol*. [See vol. iii. p. 215.]

Ruibarbo ; Ferraria purgans, Mart. (*Irideæ*). The fleshy rhizome is used as a purgative, tonic, and emmenagogue in doses of two to four drachms in infusion or powder.

Samuhú (Guar.) ; *Eriodendron Samauma*, Mart. (*Bombaceæ*). A large tree, known in Brazil as *Barrigada* or *Arvora da lãa ;* fruit contains numerous seeds, each surmounted with a fine, white, cottony substance, too short in staple to be spun. Subcortical part of trunk used for cordage, the wood for casks, boats, etc.

Sapirangú (Guar.) ; *Tabernæmontana* sp. (*Apocyneæ*). Yields a milky juice.

Sarandí (Guar.) ; *Phyllanthus* sp.

Sandiabó-guazú (Guar.) ; *Ajènjo* (Span.) ; *Artemisia Absinthium*.

Sandiabó-miní (Guar.) ; *Artemisia* sp.

San Francisco de las Llagas ; Cerbera Thevetia, L. (*Apocyneæ*). The bruised leaves are used as a cleansing application to ulcers and wounds.

Tacuara (Guar.) ; *Bambusa* sp. There are various species of *Tacuara*, some with solid, others with hollow stems, the largest attaining forty to fifty feet in height, with five to six inches in diameter. Small concretions, of the weight of twenty grains, consisting of silicate of potash and lime, are found in the joints ; they are identical with the *tabashir* of India.

Tacuarí-mí-hiacabaé (Guar.) ; *Gentiana* sp. A plant three feet high, used in decoction or infusion as a tonic.

Tagua-pará, *Tagua-pey* (Guar.) ; *Bambusa* sp.

Tamanduá-iacabaé (Guar.) ; *Melissa Calamintha* (*Labiatæ*).

Tamaná-cuná (Guar.). Name applied to a *Viscum*, as well as to an orchideous plant.

Tapequé (Guar.). *Euphorbia* sp.

Tarapé, *Caá-apiá* (Guar.) ; *Contrayerva* (Span.) ; *Dorstenia brasiliensis*. The root is stimulant and diaphoretic, but its alexipharmic and other virtues have been much overrated.

Tarumá (Guar.) ; *Vitex* sp. A large tree yielding a timber useful for rough carpentry. Infusion of the leaves supposed to prevent the formation of, or even to destroy, vesical calculi.

Taperibá-guazú (Guar.) ; *Laurus* sp. A lofty tree affording a useful timber.

Taperibá-mí ; Mbuy-guazú (Guar.). Various species of *Eupatorium* and *Agrimonia*, having slightly astringent properties, are comprehended under these names. Several climbing plants belonging to the first of these genera, having aromatic leaves, are used against snake-bites, and appear to differ but little from the famous *Mikania Guaco*, of Columbia.

Tambetary (Guar.) ; various species of *Xanthoxylum* (*Rutaceæ*), the aromatic bark of which is used as a sialogogue, as well as for its sudorific, diuretic, and stimulant qualities. Some of them appear to possess therapeutic properties demanding further attention.

ACCLIMATIZATION OF SPONGES.

M. Lamiral, whose departure for the coast of Syria with a view to obtain sponges for transplantation we mentioned in April last, has now returned, and presented a detailed report of his proceedings to the Société d'Acclimatation. M. Lamiral distinguishes three kinds of sponges for which there is a demand—the fine and soft sponge, called *abiand ;* the fine and hard sort, called *achmar ;* and lastly, the common sort, called *cabar* by the Arabs. These sponges are found in the Levant within the 36th and 33rd degrees of latitude ; that is, between Alexandretta and Saida. It is now universally acknowledged that sponges belong to the animal kingdom, and are an aggregate of cellules built up by gelatinous polypi similar to those which construct madreporæ, porites, and other polypifers. When the sponge is first gathered at the bottom of the sea, it is covered with a black but transparent gelatinous substance, resembling vegetable granulations, among which microscopic white and oviform bodies may be distinguished. These are the larvæ destined to perpetuate the species. When arrived at maturity, they are washed out by the sea-water which incessantly flows through the sponge ; they then swim along, by the aid of the vibrating cilia or hairs with which they are provided, until they reach a suitable rock, to which they attach themselves, and there commence a new life. This emigration of the larvæ from the parent sponge occurs about the end of June and the beginning of July. The fine qualities of sponges are chiefly found at the depth of fifteen fathoms or thereabout ; the common sponge lies at depths varying between twenty and thirty fathoms. At Tripoli (on the coast of Syria, not of Africa) M. Lamiral engaged some divers, who commenced operations on the 21st of May. The sponges gathered were immediately placed in boxes, through which a stream of sea-water was constantly made to flow, the animal matter being, of course, left on them, and protected from injury. These sponges arrived at Marseilles on the 17th of June ; thence they were taken to Toulon and the islands of Hyères, where stone troughs, with five sponges in each, were sunk in different places. The success of the experiment will not, of course, be known until next season.—*Times, Sept. 26th.*

MISCELLANEA.

Treatment of Small-Pox.—A new method of treating Small-Pox is strongly recommended by Dr. D. F. Rennie and Dr. H. O. Binden, now serving in China. The treatment consists in frictions with croton oil or tartar emetic ointment, so as to produce a copious suppuration.

Dr. Binden in his report states, that in the cases in which the treatment has been tried, when the crop of pustules (from the application of the ointment) appeared, the fever, which was previously very high, suddenly abated ; and that while in ordinary cases of variola, under the usual treatment, the face is the portion of the body to which the eruption of variola chiefly tends, under this mode of treatment, particularly if the ointment be applied early, the eruption appears to be diverted from its ordinary site of elimination, and to develop itself almost entirely on the trunk and upper extremities.

Poisoning by Syrup of Poppies.—An inquest has been held by Dr. Lankester

in the Caledonian Road, Islington, on the body of a child, aged five weeks. It was proved that the mother gave her child half a teaspoonful of syrup of poppies, to quiet it, and send it to sleep. As the child did not wake, Dr. Slater was sent for; but all attempts to restore the child failed. The Coroner having remarked on the impropriety of mothers sending their children to sleep by the agency of poison, the jury returned the following verdict:—"That the death of the child was occasioned by an overdose of syrup of poppies; and that the said poison was administered to the child for the purpose of procuring sleep, and not with the intention of destroying life."

Poisoning by Laburnum.—The following case is reported by Mr. H. Ussher, Surgeon, Canterbury, in the 'Medical Times and Gazette' of September 13:—"Two boys, aged about twelve and eleven respectively, in good health, returned home late in the evening of September 3, from an excursion. One of them was taken seriously ill about 10 P.M. with vomiting and purging, pulse weak and frequent, skin covered with clammy perspiration, and every now and then severe rigours shook his frame; muscular twitchings were observable about the face and neck; great epigastric pain was well marked; the pupils were dilated, but no headache was present. It appears that the second youth had made a small cake, and seasoned it with laburnum seeds; and as he was only sick to a slight degree, it is presumed his share of the repast was only moderate. The time between the use of the cake and the supervention of the symptoms was between thirty and forty-five minutes. A good many seeds were vomited; and the after-vomiting, induced by emetic, was very severe. The boy aged twelve was remarkably sleepy, and very cold; he was well covered up with blankets, had a little weak brandy-and-water when the stomach was quiet, and a sinapism at the seat of pain. The next morning he was convalescent. The emetic employed, and which Mr. Ussher considers a very serviceable one, was as follows:—R. Pulv. Ipecacuanhæ ʒi; Aceti ʒi; Zinci sulphatis gr. xvi. Dose, one teaspoonful, which will generally be found sufficient.

Poisoning by Sulphate of Zinc.—A case is reported by Mr. Marsh, House Surgeon, St. Bartholomew's Hospital, in the 'Medical Times and Gazette' of September 6, of a man, aged fifty-two, who took by mistake a wineglass of lotion which a veterinary surgeon had recommended him to use for a horse under his care. He was seized, almost immediately after taking the liquid, with pain at the epigastrium, and sickness. A mustard emetic was given to ensure the removal of all the poison from the stomach, and he was ordered to take emulcent drinks, six ounces of brandy daily, and liquor opii sedativus when in much pain. During the next three days he improved slightly; but on the fourth day he sank rapidly, and died on the fifth. The lotion on analysis proved to be a very concentrated solution of sulphate of zinc.

Poisoning by Belladonna Berries.—The University Botanic Gardens in Cambridge are thrown open to the public during certain hours of the day, and on Saturday, September 6, several children gained access to the department known as "The Physic Garden," and appear to have eaten largely of the berries of *Atropa Belladonna*. On their return home they were seized with vomiting, and three of them throughout the following day were in considerable danger; but by the unremitting attention of the medical men called in, they recovered.

The Alleged Poisonings by Arsenic.—At the resumed examination of Constance Wilson, on the charge of wilful murder by poison (see p. 90), the results of the analysis of portions of the body of the late Mrs. Atkinson, by Mr. Nunneley and Professor Taylor, were given. At first the indications obtained by Mr. Nunneley were supposed to be those of arsenic, but were subsequently proved to be those of mercury. The portions of the body of the late Mrs. Soames reserved for analysis were so far decomposed as scarcely to be recognisable; and in this case also no trace of arsenic could be discovered. Dr. Taylor and Mr. Nunneley, with other witnesses, were bound over to appear to give evidence at the trial at the Central Criminal Court.

Accidental Poisoning by Oxalic Acid.—On Saturday, August 24, a man named Patrick Ferrall, aged 58, died from the effects of oxalic acid taken by mistake for Epsom salts. It appeared from the evidence adduced at the inquest, held by Dr. Lankester, that at the request of deceased his wife had gone to the shop of Messrs. Bainbridge and Pound, Leather Lane, for some salts and senna. On opening the

packets she found both to be apparently the same; she took them back, but found the shop closed. On her return, she dissolved the smaller packet of crystals in water, and handed the solution to her husband, who drank it. Vomiting and purging immediately set in, and in less then an hour death took place. An examination was made by Mr. Cuff, who stated that the stomach indicated the presence of some irritant poison. The contents of the stomach, which he tested for oxalic acid, with nitrate of silver and the the lime test, both gave the characteristic precipitates. He had no doubt that death was produced by oxalic acid. Mr. Matthew Pound said, that on the night in question he was very busy, that himself and four assistants had as much as they could do for five or six hours, and the only way he could account for such an accident was, that the woman had taken up by mistake a packet that was not intended for her. The packet was boldly labelled, "Oxalid Acid—Poison," but it appeared the woman could not read. The jury returned a verdict of "accidental poisoning by oxalic acid," and appended the following:—"The jury cannot separate without expressing a strong conviction that sufficient caution was not used in Mr. Pound's establishment in the selling of the drugs through which the fatal result occurred in the case of Patrick Ferrall."

Suicides by Oxalic Acid.—On Tuesday, August 26, an inquest was held before Mr. Langham, on the body of Douglas Gray, aged fifty-six, a bonnet-blocker, residing at 30, Stanhope Street, Clare Market, who died from taking a quantity of oxalic acid and salt of sorrel. A *post-mortem* examination of the body was made by Dr. Lovett, who found in the stomach a quantity of oxalic acid and salt of sorrel sufficient to destroy life. A verdict of temporary insanity was returned. Another case of suicide by the same poison was that of a woman named Margaret O'Brien, aged forty, who, in a state of despondency at the loss of her son, swallowed some oxalic acid. It was proved that on Wednesday, August 20, she purchased a pennyworth of oxalic acid, and that about half an hour afterwards she died, according to the medical testimony adduced, from the effects of the poison. The following verdict was returned:—"Suicide from poison, in a state of unsound mind."

REVIEW.

A Handbook of Volumetrical Analysis. By Robert H. Scott, M.A., T.C.D., Secretary of the Geological Society of Dublin, and Lecturer in Mineralogy to the Royal Dublin Society. Longman and Co. 1862.

The manifold advantages of volumetrical processes for the estimation of bodies have rendered them favourites with all classes of chemists; but to those engaged in commercial or technical analyses, the rapidity of their execution renders them especially valuable, and indeed almost indispensable. Many of these methods admit of extreme accuracy; and by affording less chance for loss or error, are even more trustworthy than ordinary weight analyses. Within late years this system of analysis,—or perhaps we should more correctly say, of *determination*, for it is *not* analysis, which, strictly speaking, signifies *separation*,—has received great extension and improvement; and several Continental chemists have especially devoted themselves to its cultivation. Unfortunately, however, the descriptions of these processes are only to be met with in foreign works, or picked out of the scientific journals and books relating to technical chemistry, etc.; and the student has, consequently, considerable difficulty in making himself acquainted with the various methods of volumetrical determination at present used. It was therefore with considerable pleasure that we received the announcement of the little book now under our notice.

We must confess, however, that the author has a little disappointed us. In his anxiety, we presume, to preserve the credit of volume determinations, he has only given us those methods which, *in his opinion*, are worthy of general adoption. This rule has been so rigidly enforced, that many methods of great value and general use have been excluded from the work, simply because the author had a prejudice against them, or considered others preferable. Thus, Mr. Scott dislikes all processes in which the termination of the action is ascertained by taking a drop out of the solution and testing it. For this reason only, Penny's method of determining iron with a

solution of bichromate of potash is not given, although the author admits that in "other respects it is of great value." The same reason also, we suppose, has excluded the common method of valuing chloride of lime by ascertaining how much is required to oxidize a given amount of protosalt of iron; the termination of the action being indicated by testing a drop with ferridcyanide of potassium. He does indeed give us Liebig's process for urea, but apparently only under protest, and because no other exists. He states:—

"This rule, however, cannot be strictly adhered to, as some methods of daily application—for instance, that of Liebig for the determination of urea—are executed in this way. The completion of the reaction with urea is indicated by the change of colour from white to yellow in the precipitate produced by carbonate of soda, in a drop taken from the solution and placed in a watch-glass. There are few who have practised this method who have not been struck by the great inconvenience and delay entailed by the necessary washing of the watch-glass."

Surely, Mr. Scott, this washing of the watch-glass is not "necessary"? A dozen small drops of the carbonate of soda, dotted over a plate of glass or porcelain, would, we should think, be the common method of operating. Although it was of course necessary that the author should exercise his discretion in selecting or rejecting different methods, yet this very autocratic treatment appears to us to diminish the value of his book; for the student employing it may be left in ignorance of many processes in daily use.

Following the plan of some Continental authors, Mr. Scott arranges all volumetrical analyses under three heads; these are:—

"1. Saturation analyses, including alkalimetry and acidimetry.

"2. Oxidation and reduction analyses, including, as the chief subdivisions, all analyses executed by means of permanganate of potash, and those executed by means of iodine and starch paste.

"3. Precipitation analyses, including all those in which the termination of the action is shown either by the formation of a precipitate or the cessation of its formation."

The first division comprehends simply alkalimetry and acidimetry, and may be found, we almost think better described, in any manual of chemistry. The second and third divisions constitute the valuable portion of the book.

May we attribute to this system of classification some of the omissions we have referred to? Thus, the valuation of nitre is described in the second part, but we have only one process given, that of Pelouse. The method of Gay-Lussac, which would have belonged to another section, is not even mentioned. Yet Mr. Abel's process, which is founded upon Gay-Lussac's principle, is far more accurate than Pelouse's, and is more generally employed. Again, the coloration method for the determination of grape sugar, which would not have come under either of the above divisions, is not referred to, although it is constantly used by several eminent chemists.

Throughout the work the French, or metrical, system of weights and measures has been adopted. This is by far the best suited for all analytical operations, and it is very desirable to encourage its use. It would perhaps have been of benefit to the student, hitherto accustomed to English weights, if Mr. Scott had appended a table, showing the different denominations of the French system, and their relations to each other. Although these are so simple, it requires a little practice to render them familiar.

In the introduction of the book, in which the author defines the strength of the normal or test solutions, an absurd blunder is committed:—

"We shall, throughout this work, consider a normal solution of any substance to be one which contains one equivalent of that substance expressed in grammes, in 1000 grammes, or one litre, of liquid: *e. g.* a normal solution of sulphuric acid contains 49 grammes, corresponding to one equivalent of HO,SO_3, diluted with water to the bulk of one litre. If, now, of such a liquid a known volume, say 375·8 cubic centimètres, are required to saturate a certain quantity of alkali, we know that ·3758 gramme of English oil of vitriol were required for the purpose."

If "English oil of vitriol" means HO,SO_3, we know nothing of the kind. Mr. Scott of course means that 0·3758 *of an equivalent* of oil of vitriol, will have been used. The actual weight of this quantity would be found by multiplying 375·8 by 0·049.

Again, another slip of the pen, likely to puzzle the student, is committed in describing the method of obtaining test sulphuric acid for alkalimetry. We are told to "take 10 c. c. of the acid (oil of vitriol), dilute it with ten times its bulk of water." To do this we must add 100 c. c. of water to the 10 c. c. of acid, when we shall obtain 110 c.c. of liquid. Yet the author afterwards calculates as if we had only obtained 100 c. c.!

Although this little book will not afford the student all the information he may desire, or ought to possess, yet it contains a great deal of very useful matter, clearly and distinctly arranged, and will constitute a useful guide with which to commence the practice of volumetric analysis.

BOOKS RECEIVED.

INTRODUCTION TO THE ART OF LARYNGOSCOPY: A NEW METHOD OF DIAGNOSING DISEASES OF THE THROAT AND LARYNX. By JAMES YEARSLEY, M.R.C.S., etc. London: John Churchill, New Burlington Street. 1862.

HISTORICAL RESEARCHES ON EXUTORIES, ALBESPEYRES' BLISTERS, AND BLISTER PAPER. By FUMOUZE. Paris: Chamerot. 1862.

TO CORRESPONDENTS.

M. P. S. (Great Malvern).—Formulæ for the Syrups of the Superphosphates will be found in this Journal, vol. i. (2nd series) p. 497. We are not acquainted with any formula for the syrup alluded to as containing lime, soda, and magnesia.

Medicus (Dublin).—*Camphine* is represented by pure oil of turpentine; but we presume that our correspondent refers to *paraffin*. See vol. ii. (2nd series) p. 389. The purified rock oils of America and Canada are sometimes sold as paraffin.

Juvenis.—No.

H. S. B. (Chard).—(1) The particulars required will be forwarded, on application by letter to the Secretary, 17, Bloomsbury Square. (2) It is a matter for private arrangement between the apprentice and his employer.

Justitia.—The regulation in question applies to all Associates, whether "Major" or "Minor." Major Associates are eligible to be elected Members on commencing business on their own account.

R. (Lynn).—Caprylic acid, $C_{16}H_{16}O_4$; Pelargonic acid, $C_{18}H_{18}O_4$.

S. B. (Bristol).—*Fucus vesiculosus* may be obtained on any part of the coast, and can now be procured through any herbalist.

J. A. (Peterborough).—The solution may be made by boiling together, for about ten minutes, Sulphur ℥x, Slaked Lime ℥xxx, Water Oiiss.

E. M. H. (Plymouth).—(1 and 2) We cannot give the information required. (3) The roots of plants are not required except they present some specific character, which is rarely the case. A piece of a plant, if it presents the general characteristics, is sufficient.

S. S. S. (Aylesbury).—See Vol. XII. page 484.

An Assistant (Southampton).—In making tinctures according to the 'London Pharmacopœia,' it is not intended that the resulting product should, by the addition of more liquid, be made to measure the same as the original quantity of the menstruum ordered.

M. R. C. S. (York).—See Fownes's 'Manual of Chemistry.'

Mr. H. Bird (Liverpool) is thanked for specimens of the new "Poison Cork."

Student (Manchester).—Bentley's 'Manual of Botany.'

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, ELIAS BREMRIDGE, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. V.—NOVEMBER 1st, 1862.

USE OF METHYLATED SPIRIT IN PHARMACY.

There are two communications in the present number of this Journal relating to the subject of methylated spirit, which claim the very serious attention of Pharmaceutists. The one is a short paper "On the Purification of Pyroxylic Spirit," by Mr. H. N. Draper, from which it appears that by large dilution with water, and subsequent treatment with granulated charcoal in a series of percolators, pyroxylic spirit may be so far purified from the oils with which it is usually contaminated as to render it free from any offensive taste or smell; and the other is a correspondence between the Council of the Pharmaceutical Society and the Secretary of the Board of Inland Revenue, in which certain questions respecting the purification and use of methylated spirit are put and answered.

With regard to the first point—namely, the practicability of purifying pyroxylic spirit from the oils and other substances with which it is usually contaminated in the state in which it is met with in commerce, chemists have probably under-estimated the difficulty of accomplishing this object, and may have assumed *that* to be pure methylic alcohol which was not yet perfectly purified. Pyroxylic spirit has certainly been believed to possess a peculiar taste and smell, by which it could be readily distinguished from wine alcohol, nor indeed does Mr. Draper prove that this is not so; but it would appear from his description that the purification of pyroxylic spirit may be effected by a patented process, so that, when compared with wine alcohol and undiluted, it is "indistinguishable from it, save to the most sensitive and tutored smell and taste." He even suggests that the purification might probably be carried further than this, and we presume it would then resemble spirit of wine in all its physical characters, excepting its boiling point. The facts and suggestions thrown out by Mr. Draper deserve the serious attention of the excise authorities and their chemical advisers, as well as of the College of Physicians and those engaged in the preparation of medicines; for, although Mr. Draper is "of opinion that in its present form the patented process is not adapted to the purification of wood-spirit on a manufacturing scale," yet the fact of such a process being publicly known, and the further reputed fact that by a modification of this process methylated spirit has been purified to a great extent, and in that state used for pharmaceutical purposes, must raise questions as to the security of the revenue, and the influence which the knowledge of these circumstances may exert in the preparation and use of medicines. It will be observed that the grounds upon which the Committee of the College of Physicians have objected to the use of methylated spirit in pharmacy no longer exist in the case of a spirit purified as described by Mr. Draper. Questions would very naturally arise here, upon the discussion of which we are not prepared to enter at present.

With regard to the second point to which we have alluded—namely, the correspondence between the Council of the Pharmaceutical Society and the Secretary of the Board of Inland Revenue, it must be admitted that Mr. Dobson's communication is very explicit, and that it clears up some points upon which a good deal of misapprehension appears to have existed.

The questions that were put to the Board by the Council of the Pharmaceutical Society are virtually answered in the negative. *No person whatever is allowed to rectify or purify methylated spirit for any purpose.* The purification of methylated spirit is an illegal act, and so also, we presume, is the sale, or purchase, or use of the spirit in a purified state. Cleaned methylated spirit is therefore as much an illicit article as pure spirit of wine that has not paid the duty, and its use must be attended with far more danger of detection than the latter; for the simple discovery of cleaned methylated spirit will subject the possessor to heavy penalties, while in the case of spirit of wine it is necessary not only to discover it, but to prove that it has not paid the duty. If any doubt existed as to the illegality of dealing in cleaned methylated spirit, or of using it for pharmaceutical or other purposes, it must be set at rest by this communication from the Board of Inland Revenue.

But while restrictions are thus placed upon the use of *cleaned* methylated spirit, there is a free licence for the employment of the spirit in the uncleaned state, for any purpose other than that of drinking it as an ordinary beverage. Mr. Dobson has very clearly explained the change which has been effected in the regulations for selling and using methylated spirit by the law which came into operation in August, 1861. It no longer rests with the Board of Inland Revenue to indicate for what purposes, and by whom, this spirit shall be used, as these points are now defined by Act of Parliament. Any person (with some few exceptions) may take a licence for selling methylated spirit, and any person may purchase it from a licensed dealer, and may use it for any purpose, excepting for its purification, or for use as an ordinary beverage. There is no exception made to its use in pharmacy, and the Board of Inland Revenue have now no power to impose any such restrictions.

The Legislature have decided that methylated spirit may be freely sold and used for any legitimate purposes, and it becomes a question whether its employment for the preparation of pharmaceutical tinctures is a legitimate application of it. The Act of Parliament regulating the sale and use of methylated spirit does not touch this question, and it is one, we presume, which will have to be settled between the College of Physicians and those whose duty it is to carry out the instructions of the College in the preparation of medicines. The College of Physicians have already expressed their disapproval of the substitution of methylated spirit for pure spirit in any of the processes of the Pharmacopœia, and it is surely as wrong to make such a substitution as it would be to commit any other act of adulteration. For instance, suppose that wood naphtha itself were substituted for spirit of wine, no one surely would doubt that this was an unjustifiable substitution, and yet there might be stronger inducements to it than to the use of methylated spirit; for it appears that wood naphtha may be purified so as to render it "indistinguishable from spirit of wine, save to the most sensitive and tutored smell and taste." There is no law to prohibit the purification of wood naphtha (pyroxylic spirit), or the use of it in the purified state; therefore this substitution might be made with less injury to the quality of the product than must result from the use of uncleaned methylated spirit, and with less danger of incurring the penalties of the law than would be incurred by the use of cleaned methylated spirit. The laws and regulations affecting the sale and use of methylated spirit, are not those alone, therefore, which have to be considered with reference to the objectionable practice that has been recently

introduced, of using a cheap spirit, differing essentially from that which is ordered by the College of Physicians, for the preparation of tinctures and some other medicines. This practice must be treated as one of adulteration; and if existing laws and moral influences are not found sufficient to suppress it, an appeal must be made to the Legislature for such further aid as may be necessary.

PHARMACY AT THE INTERNATIONAL EXHIBITION.

We are enabled in our present number to give the report of the Jury, in Class 2, Section B, of the International Exhibition, on medical and pharmaceutical products and processes, which will be found to contain a great deal of interesting information, and in anticipation of which we have hitherto refrained from entering upon any detailed descriptions of the chemical and pharmaceutical objects referred to. This great show is now about to close, the days of public exhibition being concluded, and those for the dispersion of the objects exhibited having commenced. Arrangements are being made for restoring to their owners the marvellous collection of the productions of nature and art which fill the great building at South Kensington, and before many weeks have elapsed the courts and avenues which for several months have been thronged with the inhabitants of every country will become a dreary and desolate ruin, containing only the wreck of broken cases and dismantled trophies.

Among the collections to be thus dispersed is that representing British Pharmacy, which has been exhibited under the auspices of the Pharmaceutical Society. This collection was formed in compliance with a suggestion from the National Committee of Advice appointed by Her Majesty's Commissioners. Its object was to ensure a full and fair representation of the existing state of Pharmacy in this country. The proposition having been made to the Council of the Pharmaceutical Society, a committee was appointed for carrying out the proposed object, consisting of the members of the Council, the Professors of the Society, and others whose names have been published in this Journal. It was understood that the committee, and not the Pharmaceutical Society, were to be responsible for the expenses incurred in this undertaking, and it was proposed to meet these expenses by a special subscription among the exhibitors, the committee, and others. One of the first things the committee had to provide was a suitable case for the reception of the specimens. Some bottles were also required; for although in most instances these were supplied by exhibitors, yet there were many specimens presented which it was thought desirable to include in the collection, but for which the committee had to furnish bottles. A further and serious expense had to be incurred for providing an attendant, who has had charge of the collection during the whole period of the Exhibition.

The expenses incurred by the Committee are as follows:—

Cost of case, fixing, etc., as per contract	£88	16	6
Bottles, jars, etc.	18	9	10
Attendant	43	15	0
Sundries, including printing, postage, carriage of goods, etc.	7	14	10½
	£158	16	2½

A list of subscriptions was opened at the commencement of the proceedings of the Committee, but it was not then known what amount was likely to be required. The members of the Committee and exhibitors generally subscribed one guinea each, and the sum of £64. 10*s*. 6*d*., was thus collected or

promised. At the last meeting of the Committee, held on the 8th of October, it was decided that a further collection should be made to enable the Committee to clear off their liabilities, and the members then present added another guinea each to their previous subscriptions. Those who were not present, and who are willing to add their quota, are requested to transmit by Post-Office order to the Treasurer, Mr. T. H. Hills, 338, Oxford Street, or to the Secretary, Mr. Elias Bremridge, 17, Bloomsbury Square. Those who have contributed specimens to the collection are also requested to state what they wish to be done with the specimens, as the whole collection must be speedily removed from the building.

CHEMISTS AND PHARMACEUTISTS.

(*Extracted from the 'Lancet.'*)

The recent Parliamentary recognition of the chemists who belong to the organization of the Pharmaceutical Society, by granting to them immunity from serving on Juries, promises to answer in some measure the useful end which we foresaw, and which the members of the medical profession must, in the public interest, especially desire to bring about. Besides the pharmaceutical chemists, who are attested to possess the ordinary scientific qualifications necessary for the task of preparing and dispensing drugs, there is a motley host of traders outside this organization who exercise the calling of chemists and druggists. Undoubtedly a considerable number of these are persons of respectability, of sufficient attainments, and proper qualifications for their occupation. Some few, whom jealousy, inertia, or peculiar circumstances have kept out of the pale of the Society, are of considerable standing. But in the ragged army are included numbers of chandler-shop-keepers and the smallest dealers in sundries,—men who, as the Mayor, Mr. Goadsby, told his fellows in the drug trade at a meeting last week of the United Society of Chemists and Druggists at Manchester, are "no more fit for their duties than they are to be cardinals of the Holy See." No Parliamentary exemption could be given to such a body, for the simple reason that they could not define themselves. Free trade in poisons is in England carried to such an extent, that if it were once understood that a mere vendor of drugs should be exempt from serving on juries, every shopkeeper in the kingdom would add a few potent poisons to his articles of sale. The Legislature have properly demanded that those who call themselves chemists shall give some guarantee of their fitness to exercise their calling, or at least that the privilege of the order shall only be granted to those who have satisfied a test. It was stated at the meeting that of forty thousand chemists and druggists in England, only two thousand were members of the Pharmaceutical Society. It may be enough to show the necessity for generalizing a test of some sufficient kind, that it was recommended at the meeting, as a sort of ideal, that, in setting to work to define themselves, the chemists and druggists should first of all stipulate for five years' apprenticeship; next, they should be able to read a prescription, with a general idea of the intent of the prescriber; and lastly, they should be able to prove themselves conversant with doses. This done, they could with some reason invite Parliament to recommend the Home Office to send examiners through the country with a view to ascertain who were competent and who were not, With well-educated and conscientious dispensing chemists, and counter practice—that bane of the poor—discontinued, we should have a foreshadowing of an honest and practical system of medical care for the population, of which as yet but dim outlines are visible.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 1*st October*, 1862,*

Present—Messrs. Bottle, Bucklee, Davenport, Deane, Haselden, Herring, Hills, Morson, Savage, Squire, Standring, and Waugh,—the following were elected

MEMBERS.

CAPE OF GOOD HOPE.....Heynes, John.
HORNSEY ROAD .....Cooper, William Henry.
LIVERPOOL .....Mercer, Nathan.
LONDON.....Kiddle, William Lambert.
MELBOURNE .....Bowen, William.
SHIPSTON-ON-STOUR .....Pratt, Henry.
SWANSEA .....Andrew, Leyshon.

MINOR EXAMINATION, 15*th October*, 1862.

Beal, Edmund John .....Harlow.
Brown, George.....Great Driffield.
Burt, James .....Harrogate.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Allcock, Christopher	Mr. Harrison	Nottingham.
Aldham, Charles James	Mr. Seaton	Chelmsford.
Applegate, Sidney	Mr. Applegate	Upper Holloway.
Brinsmead, Thomas Jas.	Mr. Fowler	Torrington.
Brough, Henry James	Mr. Boyce	Windsor.
Court, Alfred	Mr. Reading	Warwick.
Forbes, William Thomas	Mr. Forbes	Reigate.
Goulden, Edward Baker	Mr. Smith	Walworth Road.
Green, Isaac	Mr. Phillips	Coventry.
Grosvenor, Frederick	Mr. Grosvenor	Hanley.
Johnson, Eli	Mr. Harrison	Nottingham.
Jones, Frederick William	Mr. Jones	11, Norton Folgate.
Luff, William	Mr. Luff	Oxford.
Nelson, William	Mr. Atherton	Nottingham.
Simpson, James	Mr. Halliday	Manchester.
White, James Walter	Mr. Groves	Weymouth.
Wood, Frederick	Mr. Glass	Cheltenham.
Wyman, John Sanderson	Mr. Wyman	Alcester.

* Omitted last month: Bottle, Alexander.

PHARMACEUTICAL MEETING.

Wednesday, October 1st, 1862.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to the respective donors thereof:—

Statistical Notes of Patients under Treatment in the Wards of St. Bartholomew's Hospital. From the Hospital.

The Dental Review.

The British Journal of Dental Science.

The Chemical News.

The Chemist and Druggist.

The Photographic Journal.

The Technologist.

Répertoire de Chimie.

Pharmaceutisk Tidende. From their respective Editors.

Bulletin de la Société Chimique de Paris.

Bulletin de la Société Botanique de France.

Proceedings of the Royal Medical and Chirurgical Society.

Journal of the Society of Arts.

Proceedings of the Linnean Society. From the respective Societies.

Official Classified and Descriptive Catalogue of the Contributions from India to the International Exhibition, 1862. By A. M. Dewleans. From Dr. Forbes Watson.

The Laboratory Student's Guide. By J. B. Edwards, Ph.D. From the Author.

On the Manufacture of Cod-Liver Oil. By Peter Möller. From the Author.

Traité Complet de Chimie Analytique. Par H. Rose. Two vols. From the Author.

Pharmacopœia Norvegica, 1854. From P. Möller, Esq.

The Statistical Register of Victoria from the Foundation of the Colony to the present Time.

The Catalogue of the Victorian Exhibition of 1861, *with Prefatory Essays.*

The same in German.

The same in French.

Statistical Notes of the Progress of Victoria from the Foundation of the Colony (1835–1860). By W. H. Archer, Esq.

The Victorian Government Prize Essays, 1860. All from the University of Melbourne.

Catalogue Pharmaceutique de la Pharmacie Centrale de France, 1862. From M. Dorvault.

Chinese Medical Pills. From Messrs. Schacht and Hillgenberg.

Seeds of *Feuillæa cordifolia* and the Oil expressed from them.

Specimen of the root of a species of *Aristolochia*, employed in Jamaica as a tonic and stomachic.

A bottle of liquid obtained by boiling the root in water.

Specimens of Hog-gum, from *Rhus Metopium*. All from Mr. J. Dillon, Anatto Bay, Jamaica.

Diseased Wheat, called "*Vibrio*." From Mr. H. Deane.

A specimen of Egyptian Opium, collected in Upper Egypt. From Mr. J. Stafford Allen.

Specimens of the rhizome and pitchers of *Sarracenia purpurea*. From Messrs. Butler and M'Culloch.

Chinese Plasters. From Mr. Manthorpe, Yarmouth.

A Specimen of Phosphorus. From Messrs. Eden, Jones, and Co.

The PRESIDENT was happy, at the commencement of a new Session, to be able to congratulate the Society on having obtained, by the united efforts of

the Council and the members at large, the exemption from service on Juries. He considered it a great privilege, and thought it one of the most important steps the Society had ever taken.

Mr. Burden believed that all would agree in the President's remarks as to the great benefit likely to accrue to the members of the Society from the passing of the Juries Bill. There were two points of importance to be observed respecting it, namely, that every Pharmaceutical Chemist should at once provide himself with the requisite certificate, according to the terms of the Act,* and see that his name be struck out of the Jury List in the parish or district in which he lives; and also that the Executive of the Society should immediately afford such information to the proper Officers in the several districts, that they may understand the Act, and be prepared to receive such Certificates; thus distinguishing between "Pharmaceutical Chemists" and those not belonging to the Society. He would also mention that he and Mr. Young happened to be summoned on the Old Bailey Jury just as the Bill had passed the Legislature, when they experienced considerable difficulty in attempting to gain exemption; and it was only on searching the Statute Books that the presiding Judge could be persuaded that there was such an Act as the "Pharmacy Act" in existence. The Judge, however, subsequently gave it as his opinion that all Pharmaceutical Chemists NOT *being in possession of the certificate from the Registrar of the Society*, were *not* entitled to have their names removed from the Jury Lists, and would be still liable to serve on juries *until* they had *so* proved their exemption. The expense of this Certificate was only one shilling, and he would recommend all members of the Society to make themselves secure in this respect.

Mr. Cutting (of Selby) confirmed what had fallen from the last speaker, and observed that within the last few days, he himself and other Pharmaceutical Chemists had applied for exemption before a bench of magistrates; *but* as the "Lists" appeared to have been made out before the authorities were aware that the clause exempting Pharmaceutical Chemists had become law, the Clerk of the Court ruled that the exemptions for the present year could *not* be granted. He had since then received his Certificate, and he should now see if that would have the effect of altering the decision of the Court.

The President said that if Mr. Cutting failed in obtaining his exemption, the Society, through their Solicitor,† would be prepared to take up the matter.

Mr. Palmer, having his certificate, had experienced no difficulty in obtaining the exemption.

THE DISTRIBUTION OF PRIZES.

The President said that he had now the pleasing duty of distributing the medals and certificates of honour to the successful competitors in the classes of Chemistry and Pharmacy, and Botany and Materia Medica. These prizes had been awarded by the Council at the termination of last session after special examinations for the purpose by the professors. He would now call upon the professors to announce the results of their examinations.

CHEMISTRY AND PHARMACY.

Professor Redwood said it was the duty of himself and his colleague, in accordance with the usual custom, to endeavour to show how far the young men who were about to be rewarded with medals and certificates of merit were entitled to such distinctions, and what the general conduct and profi-

* *Vide* Vol. II. 'Pharmaceutical Journal,' p. 64. Clause 8.

† See Messrs. Flux and Argles' letter in the present number, p. 200.

ciency of the students in their respective classes had been. The number of students who entered as competitors at the examinations last session was smaller than usual; but it must not be inferred from this that there had been a corresponding falling off in the attendance at the lectures, or in the diligence or proficiency of the students. He could speak most favourably in these respects of his class, as well as of their general conduct. The competition for prizes had been a very creditable one, and the students to whom the medal and certificates were awarded had fully justified their claims to the distinctions conferred upon them.

The questions and awards were as follows:—

1. Convert 9·84 grammes into Troy grains.
2. Three fluid ounces of an acid weigh 1968·75 grains: what is the specific gravity of the acid.
3. If a pound of ice at 32° Fahrenheit be mixed with a pound of water at 200° Fahrenheit, what will be the temperature of the mixture?
4. If a pound of oil at 40° Fahrenheit be mixed with a pound of water at 100° Fahrenheit, what will be the temperature of the mixture?
5. The analysis of a salt furnishes the following results:—

Silver	64·670
Carbon	14·365
Hydrogen	1·800
Oxygen	19·165
	100·000

   Calculate the atomic composition and state the name of the salt, giving the details of the calculation.
6. Give the processes of the London Pharmacopœia for the preparation of oxy-sulphuret of antimony, potassio-tartrate of antimony, bichloride of mercury, nitrate of bismuth, and diluted phosphoric acid. Describe the decompositions which occur in each case.
7. What are the impurities likely to be present in oxide of zinc, hydrochloric acid, liquor potassæ, and precipitated sulphur? How would you proceed to detect them?
8. Describe the preparation, composition, and properties of chloroform.
9. Describe the characteristic reactions of strychnine, quinine, and morphine.
10. Write the formulæ of alcohol, ether, acetic acid, nitric acid, and butyric ether on the water-type, using the ordinary equivalent numbers.

The medal and certificates were awarded as follows:—

Medal	William Augustus Tilden.
Certificates of Honour	William Augustus Tilden.
,,	John Whitfield.
,,	Stephen Henry Willsher.

BOTANY AND MATERIA MEDICA.

Professor Bentley stated that he could fully bear out the observations just made by his colleague Dr. Redwood, as to the conduct, attention, and general proficiency of the pupils attending his lectures during the last session, for on no previous session in which he had been connected with the Pharmaceutical Society had he better cause to be satisfied than in the last year. He regretted, however, that so small a number competed for the medal and certificates of honour and merit; he thought that this was due to the high estimation which the students generally entertained for some of the competitors on the present occasion, which led them to regard their success as certain. Professor Bentley added, that although the number of competitors was below the average of

former years, the number of marks obtained by them respectively was beyond the average; hence the result of the examination could not but be regarded as highly gratifying and most creditable to the candidates.

The questions for the written examination were as follows:—

1. Describe the different kinds of Woody Tissue; and mention the plants, and parts of plants, in which they are respectively found.
2. Define a Root, and mention the distinctive characters between it and a Stem. Distinguish between Epiphytes and Parasites.
3. Define the following:—Rhizome, Tuber, Corm, Bulb, Raceme, Capitulum, Spike, Umbel, Cyme, Gynandrous, Achenium, Capsule.
4. Give a brief sketch of the changes which the Crude Sap undergoes in the leaves and other green parts; and show the important practical applications which arise from a knowledge of such changes.
5. What are the physical and chemical characteristics of the rhizome and rootlets of *Helleborus niger*? and show how they may be distinguished from the corresponding parts of *Actæa spicata*.
6. What are the botanical and geographical sources of Jamaica Sarsaparilla? Describe the differences between *mealy* and *non-mealy* Sarsaparillas, and mention the characteristics of the best commercial varieties.
7. Give the botanical and geographical sources of our officinal camphor; mention its characteristics, and show how it may be distinguished from Sumatra and artificial camphors.
8. Describe the characteristics of Russian, East Indian, and English rhubarbs.
9. Give the essential characters of the following Natural Orders, and enumerate the officinal plants which they respectively contain:—Rutaceæ, Cucurbitaceæ, Valerianaceæ, Convolvulaceæ, Solanaceæ, Atropaceæ, Polygonaceæ, and Iridaceæ.

VIVA VOCE EXAMINATION.

Besides the above questions, the following plants were submitted to the candidates, who were required to name them, to state the natural orders to which they respectively belonged, to mention their medical and economic properties, and to describe any peculiarity they might present worthy of notice:—

Actæa spicata—Aconitum Napellus—Aconitum paniculatum—Althæa officinalis—Hypericum perforatum—Epilobium angustifolium—Coriandrum sativum—Eryngium maritimum—Æthusa Cynapium—Conium maculatum—Artemisia Absinthium—Matricaria Parthenium—Inula Helenium—Knautia arvensis—Centranthus ruber—Symphytum officinale—Anchusa tinctoria—Cerinthe gymnandra—Solanum Dulcamara, var. alba—Hyoscyamus niger—Lysimachia vulgaris—Gentiana asclepiadacea—Mentha viridis—Origanum vulgare—Marrubium vulgare—Fagopyrum esculentum.

The medal and certificates were awarded as follows:—

MEDAL .....John Whitfield.
CERTIFICATES OF HONOUR...John Whitfield.
" Stephen Henry Willsher.
" William Augustus Tilden.

The PRESIDENT then presented the medals and certificates to the successful candidates. In doing so, he complimented them upon their well-deserved success, and trusted that the honours they had now acquired would act as an additional incentive to further exertions.

Mr. CUTTING put some questions to the Chairman respecting the state of the School. He thought it might be advisable for the Council to issue a Circular calling upon the members to bring the subject forcibly to the attention of their Apprentices, and point out to them the important advantages to be derived by entering on a course of instruction in the Laboratories and upon attend-

ance on the Lectures. He felt satisfied that the subject required only to be better known, in order to ensure a good attendance of pupils.

The PRESIDENT replied that he would convey Mr. Cutting's suggestion to the Council, and he had no doubt they would give it due consideration. He however thought that the Council had done all in their power: they had provided the means for a sound Pharmaceutical education, and had fully advertised the Laboratories and Lectures. The 'Pharmaceutical Journal' had set forth from time to time these advantages to the rising generation, and if Students and Apprentices did not avail themselves of them, he really did not think much would be gained by the course which Mr. Cutting had suggested.

PRIZES FOR HERBARIA.

Professor BENTLEY, upon being called on by the President, rose to announce the result of the competition for the medals and certificates annually given by the Council for the best collections of British Plants. Professor Bentley said, that it was much to be regretted that during the present year no competition had in reality taken place, as only one collection had been forwarded to the Secretary; this belonged to Richard Cooper Hopgood, an Associate of the Pharmaceutical Society, residing with Mr. Hopgood, a medical practitioner, at Chipping Norton. It was a collection which reflected much credit upon Mr. Hopgood, and the Council had awarded him for it a bronze medal. He trusted that Mr. Hopgood would be present at the evening meeting of the Society in November, to receive the medal which he so well deserved, and of which he might be proud. The collection contained 335 species in a good state of preservation, and, with very few exceptions, correctly named. Professor Bentley concluded by saying, that he had every reason to believe that the small competition up to the present time for the Botanical prizes was mainly, if not entirely, due to the fact of the collection for the silver medal becoming the property of the Society, as competitors after having spent much time and labour, and incurred a good deal of expense, did not like parting with their collections. Professor Bentley said that such an impediment would not exist in future, as the last regulations issued by the Council for the Botanical prizes (see Pharmaceutical Journal, vol. iii. 2nd ser. p. 494) stated *that the collections, if desired, would be returned to the competitors.* He trusted therefore, that next year the competitors for the Herbaria prizes would be very numerous, and the collections of a highly meritorious nature.

NOTE ON *FEUILLÆA* AND OTHER DONATIONS.

Professor BENTLEY then made a few remarks upon several of the donations previously announced, including *Sarracenia purpurea*, the seeds of *Feuillæa cordifolia*, Hog-gum from *Rhus metopium*, and the root of a species of *Aristolochia*, probably of *A. odoratissima*. He said that the former was now exciting much attention in consequence of its being reputed to be a specific in smallpox. The root, or rather the rhizome, was the most active portion of the plant (see 'Lancet' for October 18). The three latter substances, Professor Bentley said, had been brought over from Jamaica for him to examine and report upon, under the impression that they were new to this country, and might prove valuable acquisitions to our remedial and economic agents. He had at once recognised them, and upon referring to the 'Pharmaceutical Journal' he found that they had been already described by Dr. Hamilton (see Pharmaceutical Journal, Vol. V. pp. 33 and 60). The seeds of Feuillæa were violently purgative and emetic. They were known in the West Indies under the name of coccoons. Besides their use in medicine, as they contained

a large amount of oily matters, they were employed by the negroes as a substitute for candles, and the oil obtained from them was used for machinery and various other purposes. The root of the species of Aristolochia was powerfully bitter, so much so indeed, that Mr. Dillon, the gentleman who had forwarded the specimens to him, stated that it was regarded as the bitterest thing in the West Indies. A decoction was considered to be a valuable tonic and stomachic. Professor Bentley said that Mr. Dillon had forwarded to Liverpool a considerable quantity of the seeds and the root, with the intention of getting them tried in this country. With regard to the Hog-gum from *Rhus Metopium*, this was regarded in the West Indies as a vulnerary, and when administered internally, as an astringent and diuretic. From the fact of some writers of repute having spoken strongly of the value of the above substances as remedial agents, Professor Bentley thought that they were well worthy of trial in this country.

The following note was then read:—

ON THE CULTIVATION OF EGYPTIAN OPIUM.

BY MR. S. STAFFORD ALLEN.

In the course of a voyage on the Nile last winter, an opportunity was afforded of examining the process of manufacturing Egyptian opium, and though the whole affair is so simple and previously well-described as to be scarcely worth mentioning, the observations of an eye-witness may possibly interest some of your readers.

The town of Gheuch is situated on the Nile, about 400 miles above Cairo, and celebrated for the manufacture of the earthern "goollehs," a sort of porous water-bottle much in use throughout Egypt.

Near this place I observed several fields (mostly small) of white Poppies (*Papaver album*), which I was informed were grown for Opium; and being curious to see the process by which this important article is produced, I paid a visit to one of them.

The poppy itself is called by the Arabs "Abou Nome," or the "father of sleep" (the term "abou" being generally used in the Arabic language, in conjunction with any remarkable quality or feature, to indicate a person or thing). The opium itself is distinguished by the name of "fiuw." As soon as the head has attained a good size, and before it has begun to dry, a long incision is made with a knife, running twice round it in a horizontal direction. From this incision a yellowish milky fluid exudes, in the form of small tears, becoming darker and harder by exposure to the sun.

This is collected every morning on a sort of rough scoop knife (all tools in use amongst the Arabs being of the rudest description), and the produce of several gatherings added together on a leaf, where they form a flat cake, which is then placed in the sun to harden.

Each head is scraped four or five times, after which it is exhausted, and is then cut and dried for seed.

The quantity procured from each head is almost infinitesimal, and the amount of a whole day's gathering exceedingly small.*

The opium manufactured here is not exported, and no more is grown than is required for home consumption.

Professor BENTLEY stated that the opium forwarded by Mr. Allen was unlike the ordinary commercial Egyptian opium. The present was covered by a poppy-leaf, whereas commercial Egyptian opium was enveloped in a leaf with radiate veins, the origin of which was unknown, but which he believed

* A specimen of opium procured at the above-mentioned place accompanied this paper.

was derived from *Platanus orientalis*. The present specimen much resembled the small Constantinople opium in flat cakes of Guibourt (see Pereira's Mat. Med. 4th ed. vol. ii. part 2, page 600).

EXEMPTION FROM SERVING ON JURIES.

TO THE PRESIDENT AND COUNCIL OF THE PHARMACEUTICAL SOCIETY.

Gentlemen,—Having regard to the numerous objections raised upon "the Juries Act" by the Clerks of the Peace of towns and liberties not strictly within counties, we think it desirable to state shortly how the statute relieves all Pharmaceutical Chemists from service, and how those entitled to the exemption may secure it.

Clause 2 absolutely frees and exempts all registered Pharmaceutical Chemists "from being returned and from serving upon any Juries or Inquests whatsoever," so that they are exempted from being returned (wherever they may reside), and are exempted from service even though they are returned.

The clause prescribing the form of precept to be issued by Clerks of the Peace is simply consequent upon, and intended to give effect to, the exemption, and it in no way curtails the unlimited operation of Clause 2.

Pharmaceutical Chemists ought to have charged themselves with seeing that they were not returned in the lists which were recently settled; but if they have been returned, they are still exempted from service, and if summoned to serve, may claim the exemption at the time of attending upon the summons. They will not be safe in disregarding any summons; they must attend, and then claim the exemption.

Production of a print of the Juries Act and a print of the Pharmacy Act, together with *a Certificate in accordance with the Pharmacy Act*, will at any time be sufficient to support a claim to exemption from service, or from being returned for service. We are, Gentlemen, yours obediently,

October 27th, 1862. FLUX AND ARGLES.

THE USE OF METHYLATED SPIRIT IN PHARMACY.

Several communications having been received from Brighton and other places on this subject, the Council memorialized the Board of Inland Revenue, with the following result:—

Resolved,—That the following Memorial, sealed with the sea Society, be forwarded to the Board of Inland Revenue, and that bo the answer be published in the next Journal:—

TO THE BOARD OF INLAND REVENUE.

The Council of the Pharmaceutical Society of Great Britain, having for some time past had their attention called to the indiscriminate use of Methylated Spirit for Pharmaceutical purposes, feel desirous of obtaining the opinion of your Board on this matter, that they may be enabled to lay before the members of the Society correct information. In the first place they would call the attention of the Board to a Minute of the Censors of the College of Physicians, dated November 25, 1857; and the Board's reply thereto, dated 3rd December, 1857; also to the Report of the Pharmacopœia Committee of the College of Physicians, and the Board's communication to this Society, dated February, 1858, respecting the above minute.

"*Royal College of Physicians, Nov. 25th*, 1857.

"The President and Censors of the Royal College of Physicians, having had their attention called to an unauthorized departure from the instructions of the Pharma-

copœia in the manufacture of tinctures and other preparations, by the use of methylated instead of pure spirit, have found it necessary publicly to express their disapproval of such departure, and beg to call the attention of the Board of Inland Revenue to the fact, that an assumed authority for this deviation from the rules of the Pharmacopœia is said to have been derived from an order or minute of the Board of Inland Revenue, giving a general permission to use methylated spirit in the preparation of medicinal tinctures and extracts."

"*Inland Revenue Office, London, W.C., 3rd Dec.* 1857.

"Sir,—Your letter of the 25th ult., enclosing a copy of a Minute of the President and Censors of the Royal College of Physicians, having been laid before the Board of Inland Revenue,

"I am directed to acquaint you that the permission granted by the Board to certain Chemists and Druggists for the use of methylated spirit in the preparation of medical tinctures and extracts was intended to be construed solely as removing any revenue restriction upon such use, without any interference whatever with the authority of the College for medical purposes.

"In consequence, however, of your present communication, the Board are prepared to withdraw all such permissions already in force, and will withhold their consent from any future applications to the same effect.

"But, before issuing any orders on the subject, the Board request to be informed whether the objection to the use of methylated spirit is confined to the cases specified in your letter,—viz. medical tinctures and extracts,—or whether it is desirable to prohibit the use of that spirit in all preparations included in the London Pharmacopœia.

"I am, Sir, your obedient Servant,

"*Francis Hawkins, Esq., M.D.*" "WM. CORBETT, *Assist. Under Sec.*"

"Having considered the question propounded by the Secretary of the Inland Revenue Office, and referred to us by the President of the College of Physicians, viz. whether it is desirable to prohibit the use of methylated spirits in all preparations used in the London Pharmacopœia, and having examined various specimens prepared for our inspection by the kindness of the President of the Pharmaceutical Society,

"We are of opinion—

"1. That wood spirit, of which methylated spirit contains ten per cent., is a variable preparation, containing an uncertain quantity of empyreumatic oils of a noxious kind.

"2. That the manufacture and sale of methylated spirit have been permitted by the Legislature, expressly on the ground that it is so nauseous that it cannot be substituted for or used in the place of ardent spirits.

"3. That preparations ordered in the London Pharmacopœia, when made with methylated spirit, differ materially in appearance, odour, and taste from the same when made with rectified spirit, and for the most part retain so much of the nauseous odour and flavour of wood spirit, that they are liable to occasion the nausea, headache, and other disagreeable symptoms, which its empyreumatic oils, whether taken into the stomach or diffused in vapour and inspired, are known to produce.

"4. That permission to use methylated spirit in some officinal preparations would act as an encouragement to its surreptitious use in others in which it was not authorized.

"5. That there is no reason for the use of methylated spirit in the preparation of medicines, except the insufficient reason of its greater cheapness, which would be more than counterbalanced by the inferiority and noxious quality of the medicines thus prepared.

"6. That consequently the substitution of methylated for rectified spirit in *any* of the processes of the Pharmacopœia should be strictly prohibited.

"Signed on the part of the Committee,

"FREDK. J. FARRE, *Chairman.*"

"*Inland Revenue Office, London, W.C., Feb.* 1858.

"Sir,—I am directed by the Commissioners of Inland Revenue to send you the accompanying Minute of the Censors' Board of the Royal College of Physicians of London, and to state that the Commissioners have ascertained that the Colleges of

Edinburgh and Dublin concur in the desire of the London College to dissipate the impression that a departure from the rules of their Pharmacopœias has been countenanced by the legalization of methylated spirits.

"Such an impression can only have arisen from very erroneous views of the powers and intentions of this Department; but, since it appears to prevail, it is necessary that the Commissioners should distinctly warn all persons using the methylated spirits in medicinal preparations that the permission granted by this Department conveys no authority to apply the spirits in any manner not sanctioned by the Colleges of Physicians.

"I am, Sir, your obedient Servant,

"THOS. DOBSON, *Assist. Sec.*"

In accordance with the views here expressed, as well as with the instructions laid down in the Pharmacopœia, the Council find it is contrary to the laws of the College of Physicians to make use of any other than pure spirit in Pharmacopœia preparations; and as the reply of the Board to the College fully sustains the necessity of an adherence to their laws, in which the Council of this Society concur, they have been surprised to find such extensive deviations from this law, to the injury of the fair trader, and enormous loss of revenue to the country.

While the Council are anxious not to interfere in any way with the legitimate use of methylated spirit for strictly manufacturing and some other purposes, they are at the same time equally desirous, with the College of Physicians, to prohibit its use in all Pharmacopœia preparations.

In addition to the extensive use of the crude methylated spirit in pharmaceutical preparations, induced by the direct sanction of Government in ordering medicines to be prepared with it for the Army and Navy, they find a method of cleaning this spirit has been discovered, whereby its use has been extensively promoted, the Revenue considerably defrauded, and the unprincipled trader gaining a great advantage over his conscientious neighbour.

With a view to set at rest a doubtful question, will you kindly answer the following queries?—

1. May any Pharmaceutical chemist, or chemist and druggist, or other person, having a still-license, rectify or purify methylated spirit for the purpose of making tinctures, spirits, etc., ordered in the Pharmacopœia?

2. May such persons purchase and use clean methylated spirit for the above-named purposes?

PETER SQUIRE, *President.*
ELIAS BREMRIDGE, *Secretary.*

October 1, 1862.

"*Inland Revenue, Somerset House, London, W.C.*, 17*th Oct.* 1862.

"Sir,—In reply to the letter to this Board signed by yourself and the President of the Pharmaceutical Society of Great Britain on the 1st inst., I am directed by the Board to inform you that,—

"1. No person whatever is allowed to rectify or purify methylated spirit for any purpose.

"2. A pharmaceutical chemist, or a chemist and druggist, or other person having a still-license, may purchase methylated spirit, and use it, *so far as this Department is concerned*, for the purpose of making tinctures, medicated spirits, etc., or for any other purpose except for that of sale as an ordinary beverage.

"In explanation of this latter statement, I am to add the following remarks.

"When the use of methylated spirit duty-free was first legalized, any person who desired to use it was required to apply to the Board for permission to do so, stating the purpose for which he intended to employ the spirit; and the permission was granted for that particular purpose (if approved) and no other.

"In consequence of the correspondence in 1857 and 1858, which you quote in your letter, the Board have since then, in all cases of application for permission to use the spirit in pharmaceutical preparations of any kind, furnished the applicant with a copy of the lithographed circular to which you refer, and explained to him that the authority which they give for the use of the spirit does not sanction its employment in any form disapproved by the Royal College of Physicians. Applications of this description are still made from time to time, and still answered in the same terms.

"Since August, 1861, however, when the Act 24 and 25 Vict. c. 91 was passed, a great change has been introduced into the trade in methylated spirit.

"By that Act, any person (except traders in ordinary spirits, beer, wine, or sweets) may take out a licence for retailing methylated spirit for any purpose except consumption as an ordinary beverage; and any person may purchase methylated spirit from a licensed retailer thereof for any purpose except as above.

"Chemists therefore need not now apply to the Board for any authority to use methylated spirit, nor, unless such application be made, can the Board restrict or caution them as to the application of the spirit. A chemist may, if he chooses, become a licensed retailer of methylated spirit, and use such quantity as he requires for his own purposes; or he can purchase the spirit from a licensed retailer, without revenue restrictions as to its use in his trade or business.

"I am, Sir, your obedient Servant,
"THOMAS DOBSON, *Secretary.*

"Mr. BREMRIDGE."

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Thirteenth Annual Meeting of this Association was held at the Royal Institution on Thursday, the 9th of October, 1862; the President, Dr. EDWARDS, in the chair.

The PRESIDENT, before the ordinary business of the meeting commenced, presented the prizes obtained by the Laboratory students of the last session, viz. a senior prize to Mr. H. Bird, for practical analysis, and the annual student prize to Mr. H. Geake, and expressed the gratification it afforded him to award these prizes.

Mr. N. MERCER, the acting Secretary, then read the Report to the Council, which was as follows:—

It is now thirteen years since the Liverpool Chemists' Association was established, and at the opening of every session it has been the privilege of your Council to be able to offer their congratulations on the increasing usefulness and prosperity of the Society. The year which has just closed offers no exception to the rule, nor have the future prospects of the Society been ever brighter than they are at the present time.

The general meetings have been well attended, especially by the junior members, and from the *résumé* of the Proceedings which accompanies this Report it will be seen that many of the communications were extremely interesting and practical. As a natural result, spirited discussions followed, and were more generally participated in by those present than has usually been the case. Your Council beg to call attention to this fact, as a large amount of information is always thus elicited which would otherwise have been lost, and every member of the Society may thus contribute to its interest and usefulness.

In addition to the ordinary meetings, your Council, emboldened by the success which had attended their efforts on several previous occasions, made arrangements for a *conversazione* in December last. The attendance was large, and your Council were much

gratified with the great interest all present took in the proceedings. Contributions were liberally furnished by many friends of the Society. Instructive lectures were also delivered by Professor Hamilton on astronomy, illustrated by an admirable series of dissolving views, and on stellar chemistry by the President, illustrated by Serrin's electric light and lantern, showing the prismatic spectra of the solar metals,—the experimental illustrations being under the direction of Mr. Ladd, of London.

Your librarian, Mr. Walker, again reports very satisfactorily of the working of the Library during the past session. There have been forty-six volumes added since the last Report—twenty by presentation and twenty-six by purchase. The circulation of books has not been quite so large as during the previous session, but this is fully accounted for by the absence from town of many of the members during the last few months.

PROGRESS OF THE LIBRARY FOR THE LAST SEVEN YEARS.

	1855–6.	1856–7.	1857–8.	1858–9.	1859–60.	1860–1.	1861–2.
No. of Volumes in Library	167	230	324	345	397	444	490
No. of Members using the Library	32	50	77	72	90	99	84
Circulation of Books	217	393	577	738	766	988	961
Amount of Fines	£1 14 0	£2 2 6	£2 6 10	£2 14 2	£3 4 2	£3 8 10	£2 4 4
No. of Members and Associates	100	143	164	167	177	186	187

Many valuable donations to the Museum have been made during the past year, especially of specimens exhibited at the meeting of the British Association; and your Council anticipate receiving similar additions at the close of the International Exhibition.

The Laboratory has been well attended, and the progress of the students highly satisfactory. Several having attended more than one session, an extra prize was offered to the senior students by the President, which was awarded to Mr. Henry Bird, the prize of the session being won by Mr. J. H. Geake.

Your Council were much gratified to find that amongst the many features of interest in the International Exhibition, the chemical products of Lancashire attracted great attention, and probably the chemical display on the part of this country has never been surpassed. Pharmacy has also been well represented by a large collection made under the direction of the Pharmaceutical Society, in which was included almost every recognized medicine used in this country.

The only legislation during the past year affecting chemists has been the recognition of Pharmaceutical chemists as entitled to exemption from serving upon juries, and thus placing them upon the same footing as members of other liberal professions.

Your Council regret that difficulties have arisen in carrying out the design of a Gallery of Science and Inventions, presented to the town in connection with the Free Library, by William Brown, Esq., the permanent charges for maintaining the scheme being beyond the present means of the Library and Museum rate, which a recent legal decision has considerably reduced. It is earnestly hoped that the public of Liverpool will not allow so valuable a donation as this building (which is now nearly complete) to be diverted from the purpose for which it was so wisely and liberally designated.

The jubilee festival of the Literary and Philosophical Society offered an opportunity to the Mayor of Liverpool to extend his well-known hospitality to members of other kindred societies, and your Council gratefully acknowledge the recognition of this Association upon that festive occasion.

The Council regret the retirement of Mr. T. D. Walker from his long and laborious duties as Librarian and Secretary of this Society, and in acknowledging his efficient services they hope that by his change of residence his health will be fully established.

The Treasurer's statement shows a balance in hand of £13. 8*s*. 5*d*.

The PRESIDENT, in moving the adoption of the Report and the Treasurer's statement of accounts, congratulated the meeting on the progress which had been made by the Association, and expressed a hope that the present session would be fully as satisfactory as previous ones; and that the prizes which he had that evening presented

would be an encouragement to young men to join the Association, and take advantage of the facilities for improvement which it offered.

Mr. BANNER seconded the motion, which was agreed to.

Mr. J. SHAW moved, "That the best thanks of the Association be given to those gentlemen who have lectured or read papers at the meetings, and to the donors to the Library and Museum."

Mr. REDFORD seconded the motion, which was carried unanimously.

Mr. A. N. TATE moved, and Mr. WRIGHT seconded, the following resolution, which was unanimously agreed to, "That the thanks of the Association be given to the officers and other members of the Council for their services during the year."

The CHAIRMAN, on behalf of the Council, briefly acknowledged the vote of thanks to that body.

The meeting next proceeded to elect four members of the Council to fill the vacancies caused by the retirement in rotation of Messrs. Shaw, Redford, Abraham, and Sumner. The retiring members were re-elected.

It was moved by Mr. WRIGHT (in the absence of Mr. J. Abraham, who had given the requisite notice), "That a copy of every proposed alteration in the Laws of which the Secretary shall have received due notice, shall be inserted in the circular calling the annual meeting."

Mr. BANNER seconded the motion, which was agreed to.

A vote of thanks to the President for his services in the chair closed the proceedings.

The following is the list of the members of the Council and other officers for the ensuing year:—*President*, Mr. John Shaw; *Vice-President*, Mr. A. Redford; *Treasurer*, Mr. R. Sumner; *Secretary*, Mr. A. Norman Tate; Dr. J. B. Edwards, Messrs. J. Abraham, N. Mercer, S. Banner, H. S. Evans, J. Dutton, C. Jones, R. Tiernan; *Teacher of Practical Pharmacy*, Dr. J. B. Edwards.

The First Annual Meeting of the Fourteenth Session was held on Thursday, October 9th, 1862; the President, Mr. J. SHAW, in the chair.

The following gentlemen were elected Members:—Messrs. R. F. Young, J. Fleetwood, W. H. Wallworth, and F. D. Delf. Mr. A. Banner was elected an Associate.

The SECRETARY announced the donation by Messrs. Holt and Banner of a specimen of the *Zostera marina*, lately proposed as a substitute for cotton. The specimen was exhibited at the meeting, and excited much interest.

Dr. EDWARDS read a letter he had received from the late Secretary, Mr. T. D. Walker, in which the writer expressed his regret that the state of his health compelled him to sever the connection which had existed for so long a time between himself and the Association.

The PRESIDENT then delivered his address.*

At the conclusion of the address, a discussion took place on some of the subjects mentioned, in which Dr. Edwards, Mr. Abraham, Mr. N. Mercer, and the President took part.

A vote of thanks to the President for his able and interesting address closed the proceedings.

BRIGHTON CHEMISTS' ASSOCIATION.

THE USE OF METHYLATED SPIRIT IN PHARMACY.

At a meeting of the Brighton Chemists' Association, held on the 26th of September, 1862, T. A. BREW, Esq., in the chair, it was unanimously resolved—"That this meeting entirely disapproves of the employment of Methylated Spirit for any pharmaceutical preparations, and considers it desirable that the Council of the Pharmaceutical Society should take such steps as they may deem necessary to prevent its use in Pharmacy."

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* The insertion of the President's address is deferred until next month, in consequence of a press of matter for the present number. [Ed. Ph. J.]

ORIGINAL AND EXTRACTED ARTICLES.

INTERNATIONAL EXHIBITION.

REPORT OF THE JURY ON MEDICAL AND PHARMACEUTICAL PRODUCTS AND PROCESSES.

The Jury for Class II.,* to which was referred the examination of chemical and pharmaceutical processes and products, was divided into two sections,—Section A, the attention of which was directed to the chemical substances used in manufactures, and the rarer chemical substances, prepared chiefly for the use of the scientific chemist, and Section B, which was required to examine the chemical substances used in medicine and pharmacy, as well as the unmanufactured drugs. These Sections proceeded with their business for the most part separately, joint meetings, however, being held, as directed by the regulations of Her Majesty's Commissioners, for the purpose of submitting the awards of each section to the entire Jury. The Section being required to present separate reports upon the various objects submitted to their notice, and to offer such remarks as the examination of these objects might suggest, the secretaries were instructed to furnish such documents to Her Majesty's Commissioners. The following Report is drawn up by the secretary for Section B :—

Accepting as convenient the classification contained in the July Dictionary, we will proceed without further prelude to review the various products to which the attention of the Section was directed.

1. Pharmaceutical Products from the Mineral Kingdom.

a. Non-metallic Substances and their Compounds.

Under this head we have to mention *Iodine*, of which samples are shown by Messrs. John Ward and Co., of Glasgow, Messrs. Picard and Co., of Granville, Messrs. F. Tissier and Son, of Le Conquet, near Brest, Messrs. Cournerie, Son and Co., of Cherbourg, and others. The last three manufacturers also contribute *Bromine*. Of iodine in a purified condition we find specimens remarkably well crystallized, exhibited by Messrs. Huskisson and Sons, of London, and Messrs. E. Roques and Co., of Paris. By the former house are also shown *iodide of sulphur* and *iodide of arsenic*, the latter very interesting from the magnitude of the specimen and its singularly beautiful crystallization. *Bromide of arsenic*, as a transparent, brownish, crystalline substance, is also shown by Messrs. Huskisson.

Iodoform is exhibited in many collections, both British and foreign; but it has been so little employed in medicine that we can hardly suppose it is intended to figure as a pharmaceutical preparation.

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* JURY FOR CLASS II. SECTION B.

J. M. Neligan, M.D., President of Section, *Dublin.*

Dr. Von Fehling, *Zollverein;* Professor of Chemistry at the Royal Polytechnic Academy, Stuttgart.

Daniel Hanbury, F.L.S., Secretary, *London;* Pharmaceutical Chemist.

Theophilus Redwood, Ph.D., *London;* Secretary to the Chemical Society and Professor of Pharmacy to the Pharmaceutical Society.

A. Schrötter, Ph.D., *Austria;* General Secretary of the Imperial Academy of Science; Professor of Chemistry, Vienna.

Salvatore Tommasi, *Italy;* Professor of Clinical Medicine in the University of Pavia.

Robt. Warington, F.C.S., *London;* Vice-President of the Chemical Society.

Dr. Wurtz, *France;* Professor to the Faculty of Medicine, Paris.

Emile Justin Menier, *France;* Chemical Manufacturer, Paris, Associate Juror.

Chloroform.—The manufacture of this important drug has been greatly advanced during the last eleven years; and chloroform now is both purer and cheaper than it was in 1851. Much of that now sold in England is prepared from "*Methylated Spirit,*" which, it may be well to explain, is alcohol of a specific gravity not lower than ·848 mixed with one-ninth of its volume of pyroxylic spirit or wood-naphtha. The alcohol, which by this admixture is rendered unfit for drinking, is exempted from duty, and can therefore be applied to many industrial purposes. It may be purchased at about 4*s.* per gallon, while the same spirit *without* naphtha cannot be had (owing to the heavy duty) for less than 20*s.* per gallon. Chloroform carefully prepared from methylated spirit is so slightly contaminated with the odour of the naphtha that for all practical purposes its purity is amply sufficient. In some samples, indeed, not even a trace of the naphtha can be detected.

Glacial phosphoric acid, the Jury have observed, is exhibited by Messrs. Morson and Son, of London, Mr. Otto Hermann, of Schönebeck, near Magdeburg, Dr. L. C. Marquart, of Bonn, and Mr. G. Kühnemann, of Kahla.

Carbolic acid, or *hydrate of oxide of phenyle,* is displayed by several French exhibitors, accompanied in one or two instances by laudatory handbills of the most extravagant character. There is also a specimen of the acid, consisting of a mass of colourless crystals, exhibited in the British department.

Dr. F. C. Calvert has lately pointed out that the medicinal properties observed in coal-tar by some French *savants* appear to depend upon the presence of carbolic acid; and that this acid, which is now manufactured in a state of purity, certainly possesses remarkable antiseptic properties.

b. Alkalies, Earths, and their Compounds.

Potash, soda, and ammonia.—The salts of potash and soda used in medicine are exhibited in large quantity by England, France, and the German States. Many of them being used in the arts more than in medicine, and being accompanied by chemical products with which pharmacy has nothing to do, have been examined by the Jury, Section A. As, however, this report would be imperfect if it contained no mention of articles so important as bicarbonate of soda, borax, nitrate, bicarbonate, and sulphate of potash, and the like, it is desirable that we should briefly advert to a few of the principal collections in which they are found:—some of the collections including these products come strictly within the scope of the present report.

Among the last-named collections belong those of Messrs. Huskisson and Sons, of London, and Messrs. Howards and Sons, of Stratford. The former exhibit phosphate of soda, nitrate, bicarbonate, tartrate, and binoxalate of potash, and iodide and bromide of potassium,—most of them show-specimens and extremely fine. Messrs. Howards exhibit borax (of which they are manufacturers on a large scale), boracic acid, carbonate, bicarbonate, nitrate, chlorate, tartrate, and hydrate of potash; carbonate, bicarbonate, sulphate, and potassio-tartrate of soda, also iodide of potassium in two forms, and carbonate of ammonia.

This carbonate of ammonia deserves mention, not only on account of its purity, but also as being derived from an unusual source, namely, the double sulphate of ammonia and magnesia, which occurs in the boracic acid lagoons of Tuscany, and which crystallizes out during the purification of the acid in this country. This double sulphate yields ammoniacal preparations which are entirely devoid of the empyreumatic odour that frequently contaminates those manufactured from the sulphate of ammonia of gasworks; a contamination easily detected in *Liquor ammoniæ* by the odour of naphthaline, which is perceptible in it after saturation with sulphuric acid.

Chlorate of potash is sent from the works of Messrs. Albright and Wil-

son, and from those of Messrs. Muspratt, of Liverpool, that from the former being remarkably beautiful. Messrs. Morson and Son exhibit some well-crystallized *chlorate of soda*, a salt which has been introduced into medicine for the same purposes as those required from chlorate of potash, over which it has the advantage of being more soluble. *Iodide of sodium*, very well crystallized, appears from the laboratories of Messrs. Davy, Mackmurdo, and Co. and of Messrs. Huskisson; *iodide of ammonium*, now sometimes prescribed by physicians, is also shown by Messrs. Huskisson. The form of hollow, truncated pyramids, which the crystals of this salt occasionally assume, and of which specimens are here shown, is worthy of notice.

Glauber's salt, bicarbonate of soda, and sal-ammoniac are shown by the Jarrow Chemical Company; iodide of potassium, chloride of potassium, and sulphate of soda by Messrs. J. Ward and Co., of Glasgow; bicarbonate of soda, also borax with the native borate of lime, from which it is prepared, by Messrs. Gaskell, Deacon, and Co., of Warrington; Messrs. Chance Brothers, of Birmingham, exhibit carbonate of ammonia and sal-ammoniac. The saltpetre and nitrate of soda sent from the works of Messrs. Richardson Brothers, of London, are most beautiful as specimens of large and fine crystals.

In the Belgian court, the Jury has observed the Glauber's salt, bicarbonate of soda, sulphate of iron, sulphate of magnesia, and sulphate of zinc, sent by Messrs. Cappellemans and Co., of Brussels; also a collection of similar character from Mr. Van der Elst, of the same city.

France contributes chlorate of potash from the St. Gobain Works; from those of Messrs. Tissier and Son, chloride, iodide, and bromide of potassium, iodate of potash, besides iodine and bromine, as already noticed. This firm, which carries on a very extensive manufacture of products from kelp at Le Conquet, near Brest, produces annually iodine and iodide of potassium, each to the extent of from 8000 to 10,000lbs., bromine 1500 to 1800lbs., and bromide of potassium 1100 to 1300lbs.

Mr. Roseleur, of Paris, sends acetate of soda and phosphate of ammonia, besides other products still less pharmaceutical; Mr. Kestner, of Thann, bicarbonate of soda and other chemical products; Messrs. E. Roques and Co., carbonate of ammonia and iodide of potassium; Messrs. Cournerie, of Cherbourg, iodide of potassium in enormous crystals, bromide of potassium, and iodate and bromate of potash; Messrs. Lalouel de Sourdeval and Margueritte, of Paris, various salts of ammonia.

The Jury have also examined with interest the products obtained from the mineral springs of Vichy, which are now the object of a considerable trade. There are two saline substances known as *Sels de Vichy*: the one, consisting chiefly of carbonate of soda, crystallizes out when the waters are evaporated to a sp. gr. of about 1·200; the other is produced by evaporating the water to such an extent that the residual saline mass sets upon cooling, and therefore contains nearly if not quite all the mineral constituents not susceptible of decomposition by the process. The first of these salts is used for making Vichy water extemporaneously, the second for baths. Of the extent to which they are capable of being produced, an idea may be formed when we know that from the spring called La Grande Grille, it is calculated that more than 1000lbs. of salts might be obtained daily, were all of its water submitted to evaporation.

Of *mineral waters* in general, it may here be stated that very numerous samples of both *natural* and *artificial* have been sent to the Exhibition, and that the Jury, having deliberately considered in what manner it should act with regard to them, arrived at the following decision:—

"That the exhibition of natural mineral waters does not call for the award of either Medal or Certificate of Honourable Mention."

"That artificial mineral waters, although, without doubt, prepared in numerous instances with skill and accuracy, do not from their nature offer characters which could enable the Jury to judge accurately of their merits, and that it would therefore be inexpedient to award premiums for their exhibition."

The Austrian court contains an excellent series from Messrs. Wagenmann, Seybel, and Co., of Liesing, near Vienna, comprising acetate, borate, nitrate, and sulphate of soda, sal-ammoniac, phosphate and sulphate of ammonia, sulphate of magnesia, etc. Mr. Moll, of Vienna, contributes phosphate and bicarbonate of soda, bicarbonate of potash, and iodide and bromide of potassium.

The Zollverein department affords several collections of the rougher chemical products, among which may be mentioned that of Mr. O. Hermann, of Magdeburg, which includes Epsom salt, and acetate and carbonate of potash, the last stated to be of unusual purity; also that of Messrs. Voigt and Haveland, of Breslau, in which we find nitre, Epsom salt, and borax. The beautiful collection of Messrs. Kunheim and Co., of Berlin, though affording but little that is pharmaceutical, contains the finest iron-alum we have seen.

Lithia.—In the year 1843, Mr. Alexander Ure, of London, drew attention to an observation of Lipowitz, that a solution of carbonate of lithia exerts a remarkable solvent power upon uric acid, and suggested that advantage might be taken of this fact by injecting into the bladder such a solution, with a view of dissolving or disintegrating uric acid calculi. From the difficulty of obtaining lithia, or from some other cause, it does not appear that Mr. Ure's suggestion led to any practical result until the year 1857, when Dr. Garrod, Physician to University College Hospital and Professor of Materia Medica in University College, London, commenced the administration of lithia internally in cases of gouty diathesis and chronic gout. Dr. Garrod observed that the atomic weight of lithium being very low (7), its oxide possesses a far greater power of saturating acids than do those of potassium or sodium; and further, that carbonate of lithia will dissolve urate of soda from a piece of gouty cartilage much more efficiently than either bicarbonate of potash or of soda. He found that carbonate of lithia, given in doses of one to four grains dissolved in water, and repeated two or three times a day, produced no physiological symptom, but that it exerted a marked influence in cases where the patients were voiding uric gravel, causing the formation of these deposits to diminish, or even to cease. In many instances in which it was administered to gouty subjects, it had the effect of reducing the frequency of the attacks, and of improving generally the condition of the patients. Dr. Garrod recommends that carbonate of lithia should be given in solution freely diluted, or still better, in the form of aerated water, with which, if desirable, bicarbonate of potash may be combined. Aerated lithia-water may be conveniently prepared so as to contain five grains of the carbonate in the half-pint bottle.

Citrate of Lithia, of which a beautiful specimen in large, transparent crystals is exhibited by Messrs. Morson and Son, is a salt of easy solubility, and may be used as a substitute for the carbonate in cases where the direct alkaline or antacid properties of the latter are not required. A granular composition, called *effervescing citrate of lithia*, is exhibited by Messrs. Savory and Moore, and by Messrs. Wright, Francis, and Co.; that of the latter firm is stated to contain one grain of carbonate of lithia in each drachm, and to produce, when water is added, an agreeable saline draught.

The sources from which the lithia salts hitherto manufactured have been obtained are, we believe, the following:—

1. *Triphyline*, a mineral consisting of the phosphates of iron, manganese, and lithia, and found at Bodenmais, in Bavaria. This source of lithia is said

to be now exhausted. 2. *Lepidolite* or *lithia-mica*, a mineral in which lithia is associated with silica, alumina, potash, etc. 3. The waters of Kreuznach, in Prussia, and of certain mineral springs in the Grand-Duchy of Baden. Lithia also occurs in *petalite* and *spodumene*, in the former of which it was discovered by Arfvedson in the year 1817, but its extraction from these minerals is not easy, and they are accordingly not employed.

Magnesia.—Calcined magnesia, carbonate of magnesia, and Epsom salt are exhibited by numerous manufacturers, both British and foreign. The sources of Epsom salt, and the magnesian products derived from them, are, through increased chemical skill, very different from what they were formerly. At the works of Messrs. J. C. Gamble and Son, St. Helen's, Lancashire, Epsom salt is manufactured (as it was formerly in those of Messrs. Chance Brothers, of Birmingham) directly from the native carbonate of magnesia, known as *magnesite*. This mineral, which occurs in abundance in the island of Eubœa, and is exported thence, contains, in addition to carbonate of magnesia, from three to four per cent. of silica, with a little oxide of iron and manganese. The process consists in subjecting it to the action of sulphuric acid, by which the carbonate of magnesia is converted into sulphate, while the silica remains undissolved. By having the mineral in excess and the addition of a little magnesia to the liquor, the complete separation of the iron and manganese is gradually effected. The solution of sulphate of magnesia, being thus obtained of the required purity, is evaporated and crystallized in the usual way. The production of Epsom salt from these works averages 800 tons annually.

At the Jarrow Chemical Works, South Shields, where Epsom salt is produced to the extent of 1000 tons annually, the material employed is the impure sulphate of magnesia, technically known as *Rough Epsoms*, which crystallizes from the residual liquors of the Yorkshire Alum Works. This impure salt, which contains a variable proportion of sulphate of iron, is dissolved and treated with calcined magnesian limestone, by which the iron is completely precipitated; the clear solution is then evaporated and crystallized.

Calcined magnesia and *carbonate of magnesia* are displayed by several exhibitors, but call for no particular remark. A solution of carbonate of magnesia in carbonic acid water (bicarbonate of magnesia) is a popular and useful domestic medicine.

Citrate of magnesia, the basis of the *limonade purgative* of Continental pharmacy, is exhibited in several collections; the best, in our opinion, is that made by the process of Robiquet, which consists in mixing carbonate of magnesia (63 parts) with citric acid (100 parts) dissolved in a small quantity of water, taking precaution to avoid any elevation of temperature. The product, which has to be dried in a stove, constitutes a light, spongy, brittle mass, readily soluble in water.* The so-called *effervescing citrate of magnesia*, though an elegant preparation, has no claim to the title it bears, as it is a mixture of tartaric acid and carbonate of soda, sometimes containing in addition a little sulphate of magnesia.

Alumina.—Numerous samples of alum, some of them very large and striking, are contributed by both British and Continental manufacturers. Most of these samples have a composition which is not that of the alum of former times, but are alum in which the sulphate of potash is replaced more or less completely by sulphate of ammonia. Such alum is to the eye precisely similar to potash-alum, and for most purposes to which the salt is applied is found equally valuable. The change in composition is due to the fact of the ammonia of gasworks being in most localities a cheaper ingredient

* Pharm. Journ. and Trans., vol. xv. (1855–6), p. 184.

for combining with the sulphate of alumina than a salt of potash, for which latter it is therefore substituted. The potash present in the alum is in some instances, we believe, entirely due to the mineral from which sulphate of alumina is extracted; but in many cases it has been added in the form of chloride of potassium. As examples of alum entirely devoid of ammonia, the samples contributed by Messrs. Maraspin, of Trieste, and the Alum Works of Tolfa, near Rome, may be mentioned.

c. Metallic Preparations.

Manganese.—The unstable constitution of the alkaline manganates and permanganates, and the remarkable facility with which they impart a portion of their oxygen to other bodies, has led to their employment as deodorizers and disinfectants. Brought into contact with putrefying organic matter, these manganese salts, by their rapidly oxidizing powers, effect a change analogous to combustion, as is evidenced by the removal to a great extent of the fetid odour which such matter evolves. In this respect they resemble chloride (hypochlorite) of lime; which, however, owing to the gaseous matter it evolves, has the advantage of coming more readily into contact with the gases of putrefaction and other offensive exhalations diffused through the air. On the other hand it has been observed by the advocates of manganese, that this evolution of gaseous chlorine is sometimes an objection to the use of chloride of lime; that the permanganates are free from such inconvenience, and that from their colour they are not liable to occasion accident through being mistaken for other liquids. Various preparations, illustrating the employment of alkaline manganates and permanganates, may be seen in the case of Mr. Condy, of Battersea, a manufacturer who has introduced these substances as hygienic agents into commerce.

Antimony.—The medicinal preparations of this metal do not call for much remark. The Jury have observed a few specimens of golden sulphuret of antimony, kermes mineral, and iodide of antimony, all of good appearance. Emetic tartar—to medicine the most important of all the antimonials—is now manufactured upon a large scale, being used, in conjunction with tannin, for fixing aniline colours upon cotton: it is shown in the Exhibition in crystals of unusual magnitude.

Bismuth.—The commonest manner of administering this metal is in the form of *subnitrate*, prepared by throwing crystals of the acid nitrate into water, and collecting the precipitated subsalt. In this process a certain amount of the nitrate is held in solution by the water, and has to be recovered by a further operation; and, moreover, the precipitated subnitrate is usually so crystalline that it requires levigation before it is in the best condition for administration. These objections do not occur in the manufacture of *carbonate of bismuth*, using carbonate of soda for precipitating the nitric solution; and carbonate of bismuth is now frequently used in England in place of the subnitrate, all the medicinal effects of which it is said to be capable of producing.

Tannate of Bismuth was recommended by M. Cap, of Paris,* who states that it has proved remarkably efficacious in the treatment of diarrhœa. But few trials of it have been made in this country.

Zinc.—The salts of zinc, as sulphate, chloride, and acetate, are well exhibited, but demand no particular comment. A solution of crude *chloride of zinc* is sold as a deodorizer of the foul water of sewers, cesspools, etc., and is also used as a preservative for wood and cordage.

Oxide of zinc is ordered in the London Pharmacopœia to be prepared by

* 'Bulletin de l'Académie Impériale de Médecine,' Nov. 1859.

decomposing the basic carbonate by ignition; so prepared, it constitutes a yellowish-white powder, completely and readily soluble, without effervescence, in dilute sulphuric, nitric, or hydrochloric acid. Another form of oxide of zinc, frequently sold, and preferred by many on account of its whiteness and its lower price, is prepared by decomposing a sulphate or chloride of zinc by ammonia, and washing and drying the precipitate. This substance is not, however, true oxide of zinc: if it has been prepared (as actually directed in the London Pharmacopœia of 1824) from sulphate of zinc, it is a basic sulphate containing thirty-six per cent. of sulphuric acid and water; while, if it has been prepared from chloride of zinc, it is a basic chloride. The basic carbonate of zinc is also sometimes sold for oxide. Such substitutions are by no means allowable.

Cadmium.—The iodide and bromide, both very beautiful salts, used chiefly in photography, are exhibited by several manufacturers. The iodide is occasionally employed in medicine in the form of an ointment, which is said to have the same effect as one of iodide of potassium.

Lead.—Although acetate of lead belongs rather to technical than pharmaceutical chemistry, it may be allowed us to notice the magnificent specimen of this salt, sent from the Melincrythan Chemical Works. We find commercial acetate of lead of excellent appearance shown by several German exhibitors.

Iodide of lead, from its beautiful colour, and the facility with which it is prepared, occupies more room than its importance deserves; a similar remark may be applied to biniodide of mercury.

Cerium.—The introduction into medicine of this metal, like that of chloroform, is due to Dr. J. Y. Simpson, of Edinburgh. This physician has used the *nitrate of cerium* and the *oxalate* of the protoxide: the latter, which is now principally employed, is administered as a remedy for obstinate vomiting in pregnancy, in the dose of one to two grains three times a day. Oxalate of cerium, which, as found in commerce, has been stated frequently to contain lanthanum, may be extracted, by a somewhat lengthy process,* from the Swedish mineral cerite, a basic hydrated silicate of the metals of the cerium group—cerium, lanthanum, and didymium. Oxalate of cerium, which is a white powder, is exhibited by Marquart, of Bonn, Lamatsch, of Vienna, and Morson and Hopkin, of London.

Iron.—The medicinal products of this metal are exhibited in great variety. As the basis of all, we find the protosulphate, of which there are numerous excellent samples from all quarters. Metallic iron reduced by hydrogen, the black oxide, the peroxide, sulphuret, perchloride, iodide, bromide, arseniate, pernitrate, peracetate, lactate, valerianate, potassio-tartrate, ammonio-tartrate, and ammonio-citrate are each abundantly represented. These preparations, many of which are contributed by all countries, from Brazil to Turkey, are generally of excellent quality. We may remark in passing, that the iodide preserved from oxidation in a saccharine solution (*syrupus ferri iodidi*) does not appear to be so highly appreciated upon the Continent as it is here. We may also observe that the valerianate of iron, generally found in commerce, is not the extractiform substance perfectly soluble in spirit of wine, which is produced when valerianante of soda is exactly decomposed by a persalt of iron. It is on the contrary an amorphous rust-coloured powder, very imperfectly soluble in spirit.

In addition to the ferruginous preparations already mentioned, which are most of them well known, and which one would think ought to fulfil every possible indication, we find a considerable number of which the introduction,

* Mayer, in 'Chemical News,' June 30, 1860.

or proposed introduction, is recent. We allude to such compounds as the following:—citrate of iron and strychnia, citrate of iron and quinine, citrate of iron and quinidine, citrate of iron and cinchonine, citrate of iron and zinc, citrate of iron and manganese, lithio-citrate of iron, pyrophosphate of iron and quinine, etc. These preparations, which emanate from various laboratories, are non-crystalline, but in the form of beautiful shining scales, an appearance so attractive that their really objectionable character is apt to be overlooked. When we consider the advantage of having chemical medicines of definite composition, and that this composition should be easily determinable, we think it will be seen that the use of compounds such as we have just enumerated, should be strongly discouraged. *Citrate of iron and quinine*, although an elegant and now established medicine, is one which has been the subject of so much sophistication that we are ready to think it were better if it had never been introduced. The absence of any authoritative formula for its preparation, and the practical difficulty of quickly and accurately determining its composition, together with an unscrupulous competition in price, have contributed to render it, as found in commerce, an extremely variable compound.

The *citrate of iron and strychnia* is a preparation no less exceptionable. Strychnia is an agent of such potency that its purity and definiteness are of the highest consequence. Fortunately there is no difficulty in obtaining it pure and in demonstrating its purity. But can the same be said when it is combined with citrate of iron? Can one pharmaceutist in a hundred determine that the citrate of iron and strychnia which he purchases has the exact composition its label professes? Must he not accept it upon the good faith of the vendor? That this salt is a *chemical* compound, and that the strychnia which it should contain to the extent of one per cent. is anything else than a mixture, no one, we imagine, would venture to assert.

Our objections to the other combinations of citrate of iron are of the same character. They are naturally indefinite in composition, do not admit of very easy analysis, and present no advantage which would not be obtained by administering the ferruginous salt with any particular adjunct the prescriber might consider desirable.

Mercury.—General collections of the medicinal salts of this metal are exhibited by Messrs. Howards and Sons, of Stratford, Messrs. May and Baker, of Battersea, Messrs. Davy, Mackmurdo, and Co., of London, and Dr. Lamatsch, of Vienna; small collections and single specimens are shown by numerous other exhibitors.

Calomel.—Among the specimens in an unlevigated state, there is none to surpass in size and beauty the mass displayed by Messrs. May and Baker. We may observe, however, that much of the calomel found in commerce is prepared by a process of sublimation which renders unnecessary the levigation which is requisite for that sublimed in a massive form. The former variety of calomel is whiter than that which consists of the pulverized crystals.

Silver.—The great demand for the nitrate for photography has almost removed it from the department of pharmacy, and placed it in that of chemicals manufactured for technical purposes. The Jury have observed it in several collections, and have also noticed the caustic points of Messrs. Johnson and Son, which appear very well made.

Oxide of silver, as a pharmaceutical preparation, is displayed by two or three exhibitors.

2.—Pharmaceutical Products and Preparations from the Vegetable Kingdom.

a. Vegetable infusions, decoctions, and solutions.—Numerous specimens of

aqueous infusions and decoctions in a concentrated form, preserved with a minimum amount of alcohol, are exhibited in the British section of the Exhibition. Many of these preparations, which display considerable pharmaceutical skill, would doubtless be found useful and convenient medicines, but the Jury can by no means admit that their employment in the place of freshly made infusions would be a desirable innovation. Analogous to the preceding, but in a still more concentrated form, may be mentioned the preparations known as *fluid extracts*, a considerable variety of which are used in North America, as may be seen by examining the specimens contributed by the Philadelphia College of Pharmacy, and by Mr. W. Saunders, of London, West Canada. The only fluid extract in common use in England is that of sarsaparilla, a preparation containing about half its weight of extract of pilular consistence, together with a little alcohol. Several other fluid extracts are exhibited, as those by Messrs. Savory and Sons, which include fluid extracts of opium, taraxacum, rhatany, roses, sumbul, etc. These preparations are stated to contain about fifteen per cent. of glycerine.

Solutions of various medicinal substances in pure glycerine, called *Glycerides*, are shown by Mr. W. Dickinson, of London, as convenient preparations for the external and internal administration of medicines. Among a considerable number we have observed the following:—Glyceride of aloes, of senna, of chloride of zinc, of bromide of iron, of iodide of sulphur, and of sulphuret of potassium.

b. Tinctures and syrups are shown in the collection of medicines exhibited under the auspices of the Pharmaceutical Society of Great Britain; there are also some preparations of this class contributed by Holland, Portugal, and Turkey.

c. Extracts and inspissated juices.—The collections of these preparations in the British section of the Exhibition appeared to the Jury for the most part highly commendable. Among those that were noticed with especial satisfaction, the extracts of Mr. Holland of Market Deeping, and of Mr. Ransom, of Hitchin, may be cited. The Jury had also great pleasure in examining the extracts prepared by Mr. Squire, Messrs. J. Watts and Co., Messrs. Wright, Francis, and Co., Messrs. Curtis and Co., and Mr. W. Hooper, all of London. But few pharmaceutical extracts have been sent to the Exhibition from abroad, which is probably due to the unattractive appearance of such preparations, and also to the fact that in Germany at least they are not manufactured on a large scale, but generally in the laboratory of each pharmaceutist. An Austrian exhibitor has however contributed a series of the extracts prescribed in the Austrian Pharmacopœia: the Jury have examined them, but have not been favourably impressed with them as compared with similar products from English laboratories.

In France, extracts are extensively manufactured by Mr. Berjot, of *Caen*, who exhibits a large number. These extracts, which in appearance are entirely different from those of the British pharmaceutist, are prepared *in vacuo*, the evaporation being carried to complete dryness. Thus produced, we find them in the form of dry pieces, often several inches in length, and of an oblong form, very porous and light, and generally pale in colour. Extract of liquorice, for instance, as shown by Mr. Berjot, is in extremely light and spongy, pale-buff, brittle, oblong cakes: in fact, in appearance it suggests pieces of *dried froth*. All the extracts are contained in wide-mouthed bottles, each provided with a hollow, metallic stopper, ingeniously contrived to contain *lime*, the object of which is to absorb the humidity of the air necessarily admitted each time the bottle is opened. In fact they are mostly so hygroscopic, that without some precaution of this nature, it would be impossible to maintain them long in their original condition; as evidence of which

we may state that three or four, of which we enclosed small specimens in pill-boxes, were found at the expiration of a few days to have shrunk to perhaps a tenth of their original volume, and to have assumed the form of ordinary soft extracts.

Of the care with which Mr. Berjot's extracts are prepared we entertain no doubt; but we are far from being convinced of the expediency of carrying the desiccating process to the highest extent, and of attempting to maintain the extracts in a perfectly dry condition for daily use. We think that such extracts present in general a very favourable condition for transport to other countries, being, we should imagine, susceptible of no change so long as they are kept dry. But upon the shelves of the dispensary, where a large business is carried on, we can imagine that they would, from their proneness to change, be a source of perpetual annoyance. Still, as we are assured* that Mr. Berjot disposes commercially of his dry extracts to the extent of 4400 lb. (2000 *kilo.*) annually, it appears evident that our objections have not all the practical force we should otherwise be ready to claim for them. Vegetable extracts, also prepared *in vacuo* and reduced to dryness, but in a massive and not porous form, are shown by Mr. Menier, of Paris.

Extract of liquorice is exhibited by several Italian, French, and Spanish manufacturers, amongst whom may be mentioned the house of Barracco, which produces 200,000 kilo. annually. Very good extract is also shown in the Austrian section by Mr. Quapill, to whom is due the merit of having introduced the manufacture of liquorice into Moravia.

Under the head of extracts it is proper we should also notice the substance called *podophyllin*, recently introduced from the United States into British medicine as an alterative and purgative. Podophyllin is prepared from the root of *Podophyllum peltatum*, L. (*Ranunculaceæ*) by exhausting it with alcohol, concentrating the alcoholic solution, and pouring it into water. The dark-greenish resin thus separated, constitutes, when washed and dried, *podophyllin*. The same process is said to be adopted in America for extracting resin from numerous other roots, as those of *Sanguinaria canadensis*, L., *Veronica virginica*, L., *Hydrastis canadensis*, L., *Iris versicolor*, L., etc. etc.

d. Essential oils (*medicinal*).—The most extensive and remarkable collections are those contributed from Leipzig, where a very important manufacture of these products is carried on by the firms of Heine and Co., E. Sachsse and Co., and Schimmel and Co. Several of the oils exhibited by these houses were entirely new to most of the Jury. The essential oils of Dr. F. G. Geiss, of Aken-on-Elbe, near Magdeburg, of Dr. Wagner, Pesth, of Dr. Lamatsch, Vienna, and of Messrs. Boyer, Heil, and Co., of Gignac, Hérault, France, deserve commendation. In the British section the essential oils, though fewer in number than the foreign, are not less excellent. The principal exhibitors deserving mention are Mr. Holland, of Market Deeping, and Mr. Ransom, of Hitchin. The collections just named are those of manufacturers on a large scale; but numerous other specimens of more or less importance have also been observed by the Jury. *Cajuput oil* is sent from the Dutch East Indies, a sample also from New Caledonia, and one from New South Wales. *Oils of peppermint* and *winter-green* are contributed by the United States, and *otto of rose* by Turkey. There is also a sample of the essential oil with which otto of rose is adulterated, contributed by Mr. S. H. Maltass, of Smyrna: this oil, which, we believe, is now almost invariably mixed with the Turkish otto, is the produce of *Andropogon pachnodes*, Trin., a fragrant grass, abundant in the north-western provinces of India, and not, as sometimes stated, of a pelargonium. It is shipped from Bombay, whence it is carried to Turkey, partly by native

* 'Bulletin de la Société d'Encouragement,' t. viii. (1861), p. 143.

traders by way of the Red Sea and Egypt, and partly by way of England. From its similarity in odour to the essential oil distilled at Cannes in Provence, and in Algeria, from *Pelargonium Radula*, Ait., var. *roseum*, it is frequently sold under the name of "*Turkish oil of Geranium.*"

e. Fixed vegetable oils.—Of these substances those alone which could claim the appellation of *medicinal* were considered to belong to our Jury, the remainder being referred to Class IV.

Castor oil and seeds.—The Exhibition contains numerous samples of this oil, of which those produced in Italy deserve particular attention. This castor oil is extracted from seed grown in the north of Italy, where the plant is doubtless an annual. That shown by Mr. Mazzuchetti, of Turin, appeared to be of excellent quality; the suite of specimens, including the seeds in various states, exhibited by Messrs. Valeri and Co., of Legnago, province of Verona, deserves mention. The latter firm are stated to produce by cultivation 2,000,000 kilo. of seed annually. There are numerous other samples of castor-oil seeds, more or less remarkable for their variation in size, colour, and markings, contributed by other countries, frequently accompanied by the oil. Those shown by M. Bélanger, director of the botanical garden at St. Pierre, Martinique, comprising half-a-dozen sorts, each with the botanical name of the particular species of *Ricinus* yielding it, would form an acceptable addition to any collection of Materia Medica.

f. Vegeto-alkalies, their salts, and other crystalline principles of medicinal substances.—In this department the Exhibition presents a display which is highly creditable to the progress of chemical knowledge, and its application to industrial purposes. Nor should it be otherwise when we reflect on the extraordinary attention which organic chemistry has of late received, the great diffusion of knowledge regarding its laws, and the numerous triumphs which in various directions it has achieved.

Vegetable alkaloids are contributed by England, France, Germany, Italy, Turkey, and Brazil—many of them as specimens of unequalled purity and beauty. To commence with the most important, we will notice those of cinchona bark.

Quinine.—The sulphate is exhibited by two English and several German, French, and Italian manufacturers. Many of the samples were chemically examined by the Jury, and were found in every case to be of satisfactory purity. The purity of a drug so important and high-priced as quinine ought to engage the attention of each pharmaceutist, who should rigorously refuse all which may not stand the required tests, nor should the medical man and the directors of hospitals exercise a less vigilant care. The use of quinine imperfectly purified is open to objection, for which the reduction in price by no means compensates. The admission of so valuable a medicine in a form acknowledged to be impure, and that without any standard by which to determine the amount and nature of purity which are to be held allowable, affords opportunity for sophistication only limited by the principle or prudence of the manufacturers. In such a compound, the question must naturally arise—How much of this effect is due to the quinine, how much to the quinidine, and how much to the other constituents of this preparation? We think it would be altogether more scientific to discard such a substance, and to employ the cinchona alkaloids in those forms of purity in which they are now so easily obtainable.

The quinine salts exhibited are very numerous, and, we may add, very unnecessary, so far as medicine is concerned. The citrate, phosphate, hypophosphite, hydrochlorate, acetate, lactate, valerianate, tannate, kinate, picrate, and hydroferrocyanate, are all to be seen.

Cinchonine and *quinidine*, and their salts, are also displayed in several di-

rections; *aricine* and its sulphate, so far as we are aware, in only one—that of Messrs. Howards and Sons. This house also exhibits a specimen of the cinchonidine of Pasteur, and a very large one of its sulphate. Sulphate of cinchonidine is also contributed by Messrs. Dufour Brothers, of Genoa.

We may also here name as eminently worthy of notice (mainly as an indication of skill and patience) the extraordinary series of cinchona products displayed by Dr. Zimmer, of Frankfort-on-Maine. This series, which numbers about a hundred specimens, includes combinations of the cinchona alkaloids, quinine, quinoidine, quinidine, cinchonine, and cinchonidine, with a great variety of acids, mineral and vegetable. It also includes, what are far more interesting, pure kinic acid, colourless and well crystallized, kinate of lime, pure cinchona-bark wax (a greenish-grey substance), the fatty acid of this wax in a pure state called cincho-cerotic acid (*Cincho-cerotinsäure*), dalleiochin, etc.

The chemical products of opium are extremely well represented by exhibitors from Great Britain, France, Germany, and Italy. Mr. Menier, of Paris, displays crystals of pure morphia which are the finest we ever saw, and his hydrochlorate of the same base is hardly less excellent. Codeine forms a striking object in the case of Messrs. J. F. Macfarlan and Co., of Edinburgh, whose specimen has the form of a large basin of crystals. Messrs. T. and H. Smith, of Edinburgh, Morson and Son, of London, and Menier, likewise exhibit good specimens of this alkaloid; but for magnitude of crystals there is nothing to equal that shown by Mr. Merck, of Darmstadt. Of the other principles contained in morphia, we may signalize the following as being remarkably well shown:—The narceine of Messrs. Morson and Son, meconine of Mr. Menier, papaverine, narcotine, muriate of thebaine, and meconic acid of Messrs. Smith: the last-named firm also exhibit a body named by them *thebo-lactic acid*, of which they claim the discovery, but of which no account has yet been published. They also show two thebo-lactates, namely those of copper and of morphia.

Strychnia.—The only British manufacturer on a large scale is, we believe, Mr. Hulle, who exhibits excellent specimens of the alkaloid and its salts. From the Continent we find strychnia contributed by Mr. Menier, and MM. Laurent and Casthelaz, of Paris, and Mr. Merck, of Darmstadt. Mr. Menier, whose strychnia is in crystals of remarkable size and beauty, is also the exhibitor of a large specimen of *igasurine*, the only one we believe in the Exhibition. This alkaloid, which was discovered by Desnoix about the year 1853, is contained in nux-vomica, from the liquors of which, produced in the manufacture of strychnia, it may be separated after the precipitation of that alkaloid and the brucine by lime at a boiling temperature. From these aqueous liquors the igasurine, in an impure state, may be obtained by evaporation.* Igasurine is said to have medicinal powers of the same character as strychnia; but we are not aware that exact observations upon the subject have yet been instituted.

The collection of organic chemical products shown by Mr. Merck includes several substances of great interest and rarity, exhibited in very considerable quantities. Of such we may mention *elaterine*, of which there is a large specimen, well crystallized and perfectly white; also *cubebine*, *delphinine*, *anemonine*, *sulphate of sabadilline*, and *scoparine*.

Atropine, now frequently used in the form of sulphate, for the dilation of the pupil, is shown by Mr. Menier. Messrs. Morson exhibit the *valerianate*, a salt the use of which in medicine is very undesirable, on the ground that it is not only highly deliquescent, but that it constitutes a gummy mass

* Gerhardt, 'Chimie Organique,' vol. iv. (1856), p. 182.

which it is no easy task to weigh with accuracy. It is moreover impossible to believe that the alkaloid combined with valerianic acid can occasion effects which would not be produced by the sulphate, a salt presenting no such objections.

Aloine.—Messrs. T. and H. Smith, of Edinburgh, to whom is due the discovery of aloine in 1851, exhibit it in the form of a mass of brownish-yellow crystals, which are not without beauty. Crystals of aloine, in great abundance, occur in a variety of Socotrine aloes, imported a few years since, which was in a semifluid condition, the evaporation not having been carried to the usual limit. In the aloes in question, the aloine subsides in the course of time to the bottom of the vessel as a yellow mass, the supernatant aloes being dark and transparent.

Aconitine, both amorphous and crystallized, is shown by Messrs. Morson and Son. The aconitine of these manufacturers is well known for its superiority in virulence, a fact which enables it to command a very high price. Messrs. Hopkin and Williams are also English manufacturers and exhibitors of this alkaloid.

Bibirine and its sulphate are contributed by Merck, of Darmstadt, and Macfarlane, of Edinburgh. A sample of the sulphate (now not unfrequently prescribed in London) is also sent by Mr. Knowles, of Demerara, from which colony the Bibiru bark is an export.

Santonine, which has come into extensive use since the Exhibition of 1851, is chiefly manufactured in Germany. Messrs. Böhringer and Sons, of Stuttgart, who prepare it on a very large scale, exhibit one of the numerous excellent samples admitted to the Jury.

Pereirine.—This alkaloid is exhibited by Messrs. Ezequiel Correa dos Santos e Filho, Messrs. Aleixo Gary and Co., and Mr. Peckolt, all of Brazil, and is also to be found in the case of one English exhibitor. Its history dates from 1839, when it was discovered by Blanc, of Rio Janeiro,* in the bark called in Brazil *Pao Pereira,* and valued in that country as an excellent febrifuge and tonic. This bark, the origin of which has long remained uncertain, has recently been ascertained by Dr. Allemão, of Rio Janeiro, to be derived from *Geissospermum Vellosii,* Allem., a tree of the Order *Apocynaceæ.* Pereirine is obtained by exhausting the pereira-bark with acidulated water, and treating the concentrated liquor with ammonia, which throws down the impure alkaloid. This may be rendered pure by re-solution in an acid, treatment with charcoal, and precipitation by ammonia. It then constitutes a pale-brown, pulverulent substance, which has not hitherto been obtained either colourless or in crystals. It is soluble in alcohol or ether, restores the blue of reddened litmus, unites with diluted acids to form neutral salts, which are mostly soluble in water or alcohol, but which, like the base, have only been obtained in an amorphous condition. An aqueous solution of a salt of pereirine is coloured deep crimson by strong nitric acid; a reaction which takes place even when the solution is dilute. We are not aware of any ultimate analysis of this alkaloid having been made.

g. Vegetable acids.—Tartaric and *citric acids* are so well and extensively represented in all parts of the Exhibition, that we may be excused from mentioning the samples of any particular manufacturer.

Of *Racemic acid,* a specimen by Wagenmann, of Vienna, is shown in the Austrian court.

Valerianic acid, in three forms,—anhydrous, monohydrated, and trihydrated,—is contributed by Dr. Marquart, of Bonn, who likewise sends fine *succinic* and *malic acids,* both colourless and pure.

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* Berzelius, 'Jahresberieht über d. Fortschritte d. Chemie u. Mineralogie,' 23 Jahrg. (1848), p. 372.

Gallic and *tannic acids* are freely exhibited. One specimen, that of gallic acid, shown by Messrs. DUNN, HEATHFIELD, and Co., of London, is remarkably beautiful for its crystallization.

Caincic acid, extracted from Cainca-root (Radix *Chiococcæ anguifugæ*, Mart.), is among the rare products shown by Mr. MERCK.

h. Unmanufactured drugs of vegetable origin.—In the British section of the Exhibition there is a numerous collection of these products exhibited by various contributors, chiefly under the auspices of the Pharmaceutical Society of Great Britain. The samples are mostly very fine; some of them in fact almost *too good*, as they represent exceptional rather than usual forms of the drugs they illustrate.

The British Colonies, including India, contribute large collections of vegetable Materia Medica which will repay careful study. The colonial possessions of France are also well represented, the suites of specimens from each being admirably arranged and clearly catalogued upon one general plan. We also find contributions of raw drugs from the South American Republics, Brazil, the United States, West Africa, Turkey, China, Japan, and the Philippines.

As it would unduly extend the present Report were we to attempt a detailed account of these numerous collections, we shall restrict ourselves to name a few of the more important, and also to mention in addition a few drugs which claim notice on the ground of recent introduction to European medical practice.

North American drugs are illustrated by a very excellent and numerous collection contributed by the Philadelphia College of Pharmacy. There are also numerous, well preserved specimens forwarded by Mr. WILLIAM SAUNDERS, of London, Canada, and by Mr. GIROUX, of Quebec.

To. H.E. FAIK PASHA, of Constantinople, the Exhibition is indebted for a very extensive series of specimens of raw products, alimentary, medicinal, etc., from Turkey, amongst which the numerous samples of opium deserve particular attention.

Mr. SIDNEY H. MALTASS, of Smyrna, is also the exhibitor of a fine series of opiums, besides scammony, tragacanth, and some other drugs of Asia Minor.

Mr. BÉLANGER, director of the Botanic Garden at St. Pierre, Martinique, contributes an instructive series of West Indian drugs, which the Jury consider well deserving of commendation.

Mr. THEODOR PECKOLT, pharmacien, of Cantagallo, Brazil, has sent a collection of small specimens of Brazilian drugs which deserve the attention of pharmacologists.

Dr. WELWITSCH, who has recently returned from a visit of several years to the Portuguese territories on the west coast of Africa, contributes numerous remarkable raw products collected during his journeys in those little-known regions; but the specimens being neither catalogued nor well arranged, are not displayed as they deserve.

The production of Hungary, including a few well-preserved drugs, are displayed in the collection of Mr. VINCENT JANKÓ, of which a convenient separate catalogue is published.

The great project of introducing the *Cinchona* into India receives an illustration from two or three inconspicuous jars containing cinchona bark, produced upon the plantations of the Dutch Government in Java, contributed, together with botanical specimens of *Cinchona Calisaya*, Wedd., and *C. pahudiana*, How., by Dr. JUNGHUHN.

Of the drugs which have to a greater or less extent come into use during the past few years, we may mention the following:—

Resin of scammony-root.—The rude methods employed for the collection of scammony, and the extreme variability of that drug, induced Mr. Clark, an extensive manufacturer of extract of liquorice, residing near Smyrna, to suggest the advantage that would arise from replacing it by the pure resin obtained by a suitable process from the dried root. Mr. Clark not having in Asia Minor the requisite appliances for such a pharmaceutical operation, some of the root was forwarded to Professor A. W. Williamson, of University College, London, who, after various experiments, recommended the following process:—The roots, previously crushed, are to be boiled first with water and afterwards with diluted acid, by which means they will be deprived of all matter soluble in those menstrua, while the resin will be left undissolved. They are then to be treated with alcohol, and the alcoholic solution being evaporated, the pure resin will remain. Numerous comparative trials of this resin have been made in the hospitals of London, and have established the conclusion that it is quite equal in medicinal activity to the best scammony. The substitution of resin of scammony-root for scammony is not, however, officially sanctioned, and the new drug has as yet met with but little demand.

Root of *Actæa racemosa*, L. (*Ranunculaceæ*.)—This drug, which has for many years had a place in the Materia Medica of the United States, has recently come into considerable use in England as a remedy in rheumatism, particularly in its acute forms; it has also been successfully employed in chorea, nervous headache, hysteria, etc. As a complete account of the drug, its natural history, mode of administration, etc., by Professor Bentley of London, has been recently published,* we think it unnecessary to enter into further particulars respecting it.

Kamala is the Indian name of a brick-red powder, which consists of the minute glands rubbed from the capsules of *Rottlera tinctoria*, Roxb., a tree occurring in many parts of the East Indies. It is employed in medicine as a vermifuge, and is very effectual in the dose of one to two drachms; it may also be given in the form of tincture. Kamala has been imported into London to a considerable extent, and chiefly shipped to the Continent.

Bark of *Larix europæa*, DC.; *Larch bark.*—It has been recently recommended as a stimulating expectorant, and has been prescribed by a few medical men in London and Dublin, in the form of tincture and extract. The bark, which contains numerous cells filled with resin, has an agreeable terebinthinous odour; whether it possesses any real advantage over the numerous terebinthinous remedies already in use, may well be doubted. We may mention, however, that a crystallizable volatile principle, to which the name *larixinic acid* has been given, has recently been obtained from larch bark, which at present is its only source; also that the bark contains a peculiar form of tannin.†

Guaco.—Attention has been recently called to the medicinal effects of the stems of certain species of *Aristolochia*, commonly known in South America by the name of *guaco*, and there used against the bites of venomous serpents. The drug is quite distinct from the stems of *Mikania Guaco*, H. B. K., also called *guaco* in some parts of New Granada. A good specimen, derived from *Aristolochia trilobata*, L., is sent from Trinidad by Mr. Sylvester Devenish of that island.

Bark of *Cerasus virginiana*, Michx., is employed in the United States as a tonic and sedative, and has recently been introduced to the notice of medical men in this country. It contains a bitter principle not yet isolated; also

* 'Pharmaceutical Journal and Transactions' for March, 1861.

† Stenhouse, 'Proceedings of the Royal Society,' June 28 and July 10, 1861.

amygdalin, together with a substance analogous to emulsin, which, reacting on each other in the presence of water, yield hydrocyanic acid and a volatile oil resembling that of bitter almonds.*

Bark of *Ulmus fulva*, Michx., a North American tree, is remarkably mucilaginous, and of an agreeable odour. The infusion is a good demulcent, and recommended in dysentery and strangury. The bark is also sometimes chewed as an expectorant, and in a bruised state may be used for poultices. It probably possesses no advantage over linseed, marshmallow, or other common drugs of the same class.

Anacahuite wood, a drug of unknown origin imported from Tampico, and extravagantly valued in Germany for a short time as a remedy for consumption. Experience has not confirmed the favourable statements first put forth regarding it, and it is now almost unsaleable. Chemical experiments have failed to detect in it any constituent that can explain the good effects alleged to have been obtained from its administration.

Dried herbs are well exhibited by Messrs. Butler and M'Culloch, of London, as well as by Mr. Holland, of Market Deeping, and Mr. Ransom, of Hitchin. There are also some very good samples shown by Mr. Benzon, Copenhagen, and Messrs. F. Wilhelm and Co., of Vienna. Mr. J. G. Cavalli, of Gothenburg, exhibits some medicinal herbs excellently dried in a compressed form. The Jury are not acquainted with the process adopted for obtaining the extreme compactness and beautiful appearance for which the specimens are remarkable.

3. Pharmaceutical Products from the Animal Kingdom.

Cod-liver oil.—The exhibition contains many samples of this important medicinal agent, contributed by Newfoundland (including the French islands of Saint Pierre and Miquelon), Norway, and England. The pale oil manufactured in London is much esteemed, but the supply is by no means equal to the demand, and an immense quantity of foreign oil is also consumed. This pale oil is prepared by a process originally devised by Mr. Donovan, of Dublin,† which consists in placing the perfectly fresh livers in a metallic vessel, and heating them with constant stirring to a temperature of 180° F., by which treatment they break down into a uniform, pulpy, liquid mass. This mass is immediately transferred to calico bags, whence the oil drains out; after filtration while still warm, it is sufficiently pure for use. In this state the oil contains, at the temperature of 60° F., a considerable deposit of stearine, which it is the practice of some pharmaceutists to remove by filtration, but of others to allow to remain, under the idea that the stearine (which is perfectly fluid at the temperature of the human body) is no less efficacious than the oleïne. The cod-liver oil of Mr. Peter Möller, of Christiania, is prepared by a process essentially the same as that just described.

Dugong oil.—This oil is produced from the bodies of two herbivorous cetaceous animals of the family *Manatidæ*, the one *Halicore Dugong*, Illig., an inhabitant of the Indian seas, the other *H. australis*, Owen, occuring off the north-west coast of Australia. It has been lately employed as a substitute for cod-liver oil, especially in Australia. Samples from that colony, and also from Ceylon,—afforded, we presume, by the two species of *Halicore* above named,—have been sent to the Exhibition. That from Ceylon is a solid white fat, almost devoid of odour; those from Australia are liquid oils containing a deposit of stearine; all have a slight tallow-like taste, and but little smell.

Dugong oil, having no *fishy* smell and taste, is supposed to offer an advan-

* Wood and Bache, 'Dispensatory,' ed. ii. (1858), p. 627.

† 'Dublin Journal of Medical Science,' vol. xvii. (1840), p. 357.

tage in these respects over cod-liver oil. We are not aware that any extensive trials of it have as yet been made in Europe.

Pepsine.—There are two English exhibitors of this substance, namely, Messrs. Morson and Son, and Mr. J. L. Bullock, and one Austrian, Dr. Lamatsch. Mr. Squire, as the agent of Mr. Boudault, of Paris, may also be named, though we think he does not display any specimen.

Messrs. Morson, who prepare pepsine from the stomachs of calves, exhibit it in the pure state as a grey extractiform mass: it is not, however, commonly sold in this form, being more convenient when reduced to a powder with starch, in which state it has received the name of *Poudre nutrimentive*. Mr. Boudault's pepsine, which, as we gather from his pamphlet, is prepared from the stomachs of sheep, is also mixed with starch. Mr. Bullock's pepsine is prepared from the stomach of the pig, upon the principle, we believe, that the pig's omnivorous habits render it probable that its gastric fluid would supply the best substitute for that of the human stomach. However this may be, Mr. Bullock's pepsine may well be superior in strength, as it is sold in an unmixed state. Dr. Lamatsch, as it would appear from his advertisement, employs the stomachs of both pigs and calves for the preparation of pepsine, which, like that of Mr. Bullock, is offered for use unmixed with starch.

The remaining articles of animal Materia Medica call for but few observations. The common blistering flies (*Cantharis vesicatoria*, Fabr.) are well shown among the productions of Hungary. *Mylabris Cichorii*, Fabr. (and *M. Sidæ*, Fabr.?), the best source of cantharidine, occurs among the drugs of India; a specimen of *Lytta vittata*, Fabr., in the collection of the Philadelphia College of Pharmacy, and one of *Meloe maialis*, L., among the drugs of Spain.

Cantharidine is represented by a very large and fine sample from the laboratory of M. Merck; Messrs. T. and H. Smith likewise exhibit it.

Of *Ambergris* a fine mass may be noticed in the case of a Paris perfumer, M. Claye.

Musk is not well shown, though it would have been easy in London to display a series of specimens representing it in all its varieties. Of *Civet*, there is a solitary and bad specimen sent from India. *Castoreum* is shown by a Canadian exhibitor, as well as in the collection of the Pharmaceutical Society.

Having endeavoured in the foregoing pages to present to notice those objects which more particularly claimed our attention, to communicate the information which was furnished respecting them, and to reproduce some of the observations which were made during the numerous discussions of the Jury, it is necessary that we should offer a few concluding remarks.

Pharmacy, as a distinct art, can rarely claim any great discoveries; and its advancement, of which we think the present Exhibition affords satisfactory evidence, is largely due to the increased knowledge which the labours of the scientific and manufacturing chemist have brought to bear upon it. Although we cannot but admit the importance of the services which chemistry has rendered, and is constantly rendering to the art of pharmacy, it is interesting to observe that even in those departments in which the pharmaceutist has to rely more upon his practical experience than upon his theoretical knowledge, we are not without evidences of progress. Organic chemistry, indeed, has advanced during the last eleven years with rapid strides, producing among its many useful results not a few from which medicine can derive advantage. The collections of active principles of vegetables in the present Exhibition have been observed by the Jury with the greatest interest. The magnitude and purity of the specimens exhibited, indicate manufacture on a large scale,

which in its turn is evidence that the substances shown are prepared not merely for exhibition, but actually for sale.

Much of the improvement which British pharmacy has undergone is due to the Pharmaceutical Society of Great Britain; it is not, indeed, too much to say that the exertions of this body during the past twenty years have contributed more than any other cause to raise the character and improve the attainments of the pharmaceutists of this country.* Nor is improvement confined to Great Britain or even to Europe; it is, on the contrary, observable in the exhibitions of every country; and although pharmacy is but a small area for art and science, and can afford but an indifferent criterion whereby to judge of national progress, we think that its development, as evinced by the present Exhibition, is not without value as an indication of the advancement of science, and of the diffusion of the arts of civilization dependent upon it.

[The following are the Awards made by the Jury.]

MEDAL.

United Kingdom.

505 DAVY, MACKMURDO, and Co.—Fine collection of mercurial preparations and other chemicals.

532 HOWARDS and SONS.—Quinine and other cinchona alkaloids, mercurial and other inorganic chemical products, and for a fine series of cinchona barks, illustrated by drawings and living plants.

655 HOLLAND, W.—Pharmaceutical extracts, essential oils, and dried herbs of superior quality.

536 HUSKISSON and SONS.—Series of fine medicinal chemical products.

660 MACFARLAN, J. F., and Co.—Products from opium, beberine, etc.

664 PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—For a systematic collection of the drugs and preparations used in English medicine, exhibited under the auspices of the Society.

665 RANSOM, W.—Pharmaceutical extracts, essential oils, and dried herbs of superior quality.

604 SMITH, T. and H.—Products from opium, aloïn and caffeine.

India.

49 & 57 KOONEY LALL DEY.—A large collection of East Indian drugs.

Austria.

169 ZACHERL, J.—Exhibition of the flowers of *Pyrethrum roseum*, and for the introduction of their use into Western Europe as "Insect powder."

Baden.

74 MÜRRLE, G. J.—Steam apparatus for chemical laboratories.

Bavaria.

188 WOLFFMÜLLER, A.—Steam apparatus for pharmaceutical laboratories.

Brazil.

17 & 96 PECKOLT, T.—Interesting medicinal substances, produced in Brazil, and chemical products obtained from them.

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* This society, founded by private individuals in the year 1841, received a Royal Charter of Incorporation in 1843, which, although valuable as a proof of recognition on the part of the Government, conferred no privileges of a very practical character. In the year 1852, Parliament passed the Pharmacy Act, which confirmed to the Society its Charter of Incorporation, and provided that those persons who should pass its examinations should be registered and have the exclusive right to assume the title of "Pharmaceutical Chemist." It is much to be regretted, however, that this Act in no other way restricts the practice of pharmacy; and that while the competency of members of the medical profession is ensured by stringent examinations, no qualification whatever is required by law from the dispenser of medicines, provided only that he do not assume the title of "Pharmaceutical Chemist." By an Act passed since this article was in type, *Registered Pharmaceutical Chemists* are exempted from serving upon juries in courts of justice.

18 Santos, E. C. dos, and Son.—Collection of organic and inorganic chemicals.

Denmark.

4 Benzon, A.—Pharmaceutical preparations.

France.

196 Armet de Lisle, J., and Vivien.—Sulphate of quinine.
423 Aubergier.—Opium produced in France.
145 Berjot, F.—Pharmaceutical extracts of superior quality.
91 Callou, A., and Vallée.—Products of the mineral springs at Vichy, and their preparation for use in foreign countries.
208 Dubosc, F., and Co.—Good collection of chemical preparations used in medicines.
202 Joret, E. M. F., and Homolle, E.—Digitaline and other pharmaceutical products.

French Indies.

3482 Collas, Dr.—Various medicinal substances from the French possessions in India.
3482 Lépine, J.—Various medicinal substances from the French possessions in India.

French Guiana.

3461 Local Committee.—For an interesting collection of drugs produced in that colony.

Guadaloupe.

3493 Cavalier.—Interesting collection of pharmaceutical substances produced in Guadaloupe.

Martinique.

3506 Bélanger.—An admirable collection of medicinal vegetable substances produced in Martinique.

Frankfort.

303 Zimmer, C.—Extensive series of chemical products derived from cinchona bark.

Hesse, Grand Duchy.

465 Merck, E.—Extensive and admirable series of organic chemical products.

Italy.

238 Contessini, F., and Co.—Sulphate of quinine, mannite, santonine, and other chemical products.
202 Dufour Brothers.—Organic chemical products of excellent manufacture.

Netherlands.

387 Junghuhn, Dr.—Specimens of cinchona barks produced in Java, and for his efforts in promoting the culture of the cinchona in Java.

Norway.

30 & 36 Möller, Peter.—Norwegian cod-liver oil of fine quality, and for a collection of medicinal plants.

Portugal.

1044 Welwitsch, F.—Interesting medicinal substances collected in Angola.

Prussia.

1006 Marquart, Dr. L.—Rare chemical products.

Saxony.

2305 Heine and Co.—Medicinal essential oils of excellent quality.
2308 Sachsse, E., and Co.—Medicinal essential oils of excellent quality.
2309 Schimmel and Co.—Medicinal essential oils of excellent quality.

Sweden.

106 Cavalli, J. G.—Medicinal plants dried in the form of compressed cakes.

United States.

7 Philadelphia College of Pharmacy.—Fine collection of North American vegetable drugs, and preparations made from them.

Wurtemberg.

2681 Böhringer, C. F., and Sons.—Quinine and santonine of excellent manufacture.
2737 Wolff, F. A., and Sons.—Steam apparatus for pharmaceutical laboratories.

Honourable Mention.

United Kingdom.

469 Barnes, J. B.—Collection of volatile acids and ethers.
648 Bullock and Reynolds.—Chemical and pharmaceutical products.
653 Duncan, Flockhart, and Co.—Chloroform of excellent quality.
511 Dunn, Heatfield, and Co.—Fine crystallizations of gallic acid.
1863 Goodhall, H.—Apparatus for grinding drugs.
530 Hopkin and Williams.—Chemical and pharmaceutical products.
533 Hulle, J.—Vegetable alkaloids and their salts.
565 May and Baker.—Mercurial and other chemical products.
666 Squire, P.—Pharmaceutical extracts of superior quality.
670 Watts, J., and Co.—Pharmaceutical extracts of superior quality.

India.

47 Shortt, Dr., Jno.—A collection of East Indian drugs.

Queensland.

65 Marsh, Miss.—Australian manna.

Trinidad.

—— Devenish, Sylvester.—Specimens of drugs produced in Trinidad.
—— Knowles, R. J.—Sulphate of bibirine and bibiru bark of Demerara.
—— M'Clintock.—Collection of medicinal barks from British Guiana.

Austria.

—— Hatschek, F., and Sachs.—Good collection of Hungarian drugs.
148 Quapill, R.—For extract of liquorice of good quality, and for the introduction of the culture of liquorice into Moravia.
167 Wagner, Dr. D.—Medicinal essential oils.
168 Wilhelm, F., and Co.—Valuable series of drugs and chemicals.

Brazil.

21 Castro and Mendes.—Collection of chemical products used in medicine.

China.

25 Carey, H. W.—Collection of drugs found in commerce at Hangkow, China.

Algeria.

3605 Hardy.—Algerian opium and other drugs.
3605 Mercier.—Various drugs produced in Algeria.

New Caledonia.

3469 Garnault.—Various medicinal products of New Caledonia.

St. Pierre and Miquelon.

3465 Riche.—For cod-liver oil of superior quality prepared in the Islands of St. Pierre and Miquelon, Newfoundland.

Hanover.

413 Du Bois, J. E.—Steam apparatus for pharmaceutical laboratories.

Italy.

818 Mazzuchetti, E.—Manufacture of castor-oil.
227 Ruspini, G.—Finely crystallized mannite.
228 Scerno, E.—Sulphate of quinine of good quality.

Japan.

5 Myburgh, Dr. F. G.—For an interesting series of drugs from Japan.

Netherlands.

3 Bosson, K. G. W. De.—Collection of medicinal chemical products.

Prussia.

976 Geiss, F. G.—Well-prepared essential oils.

Spain.

—— Catalan de Ocan, J.—Saffron of fine quality.
—— Zobel, J.—Collection of medicinal plants from Manilla.

JURORS OF CLASS II. WHO ARE ALSO EXHIBITORS.*

644 Hanbury, D. (Allen and Hanburys), *United Kingdom.*
570 Morson, T. (Morson, T., and Son), *United Kingdom.*
632 Young, James, *United Kingdom.*
204 Menier, E. J., *France.*
997 Kunheim, N. (Kunheim and Co.), *Prussia.*

ON THE CASCARILLA, AND OTHER SPECIES OF CROTON, OF THE WEST INDIA AND BAHAMA ISLANDS.

BY WILLIAM F. DANIELL, M.D., F.L.S.,

Hon. Member of the Pharmaceutical Society of Great Britain.

(*Concluded from page* 150.)

IV. The Willow-leaved Cascarilla.

(*Croton Cascarilla,* Benn.)

Ricinoides elæagni folio, *Plumier, Icones, p.* 236, *t.* 240, *f.* 1, *spec.* 20.
Ricinoides elæagni folio, *Catesby, History Carolina, vol.* ii. *t.* 46.
Clutia Cascarilla, *Linn. Species Plant. ed.* 1. *p.* 1042.
Croton Cascarilla, *Benn. Journ. Proc. Linn. Soc., vol.* iv. *p.* 30.

This species, indigenous to Elutheria, Long, and other large islands of the Bahamas, and formerly equally abundant in that of New Providence, became almost extirpated in the latter during the last century, a few plants now only existing at the eastern extremity of the isle. The same product appears to be also common to several districts in St. Domingo, but I am not aware that it has ever been found in Jamaica, as asserted by some writers. That this species originally yielded the Cascarilla bark of commerce, until superseded by the *Croton Eluteria,* Benn. (*Clutia Eluteria,* Linn.), there can be little doubt; for though unknown to the inhabitants of Nassau, several from Eleuteria had a faint recollection of it constituting an article of export many years since. The dried cortex was also denominated Ilatheria or Eleutheria bark, and employed by the people in the treatment of diseases, incidental to different localities of the island.

Dr. Wood, of America, and the late Dr. Pereira were both of opinion that the ordinary Cascarilla bark of the shops may have been procured from this plant, and there are sufficient grounds for belief that their conjectures would have proved well-founded had they assigned the origin to a less modern date. But I was assured by one of the wood-cutters of Eleutheria, that even recently, the bark of this Croton when met with, is collected, and incorporated with that of the *C. Eleuteria,* Benn., for exportation. This statement, however, requires confirmation.

Plumier was the first who described this Croton in his 'Species,' etc., under

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* "If Exhibitors accept the office of Jurors, or Associate Jurors or Experts, they cease to be competitors for prizes in the class for which they are appointed, and these cannot be awarded either to them individually, or to the firms in which they are partners."—*Decisions regarding Juries, Section* 5.

the title of *Ricinoides elæagni folio*, and gave a figure of it in the "Icones, etc." Catesby, in his History of Carolina, mentions it by that of *Ilatheria bark* or *La Chachrille*, and observes that the shrub "grew plentifully in most of the Bahama Islands, seldom above ten feet high, and rarely so big as a man's leg, though it is probable that before these islands were exhausted of so much of it, that it grew to a larger size; the leaves are long, narrow, and sharp-pointed, and of a very pale light-green colour; at the ends of the smaller branches grow spikes of small hexapetalous white flowers, with yellow apices, which are succeeded by tricapsular pale-green berries of the size of peas, each berry containing three small black seeds, one in every capsule. The bark of this tree being burnt, yields a fine perfume; and infused in either wine or water, gives a fine aromatic bitter."* The result of my inquiries tends to substantiate the accuracy of these statements, so far as they relate to the general history. The custom of smoking certain portions of this plant conjoined with tobacco, adopted by the earlier European settlers, either to impart an agreeable flavour, or as a stimulant and prophylactic to avert the attacks of disease, is evidently to be traced to the usages of the preceding Carib population. The term 'Ilatheria' is merely a vernacular corruption of Elutheria. Catesby's plant is the *Clutia Cascarilla* of the first edition of Linnæus's 'Species Plantarum,' who misstated the habitat of Carolina for that of the Bahamas. Nicolson, in his "Essai sur l'Histoire Naturelle de St. Dominique,"† evidently alludes to this or a similar production under the synonym of "*Ricinoides;*" and by the creole appellation of Sauge du Port de Paix.—Chaumeton, in his 'Flore Médicale' gives a tolerable illustration of it, remarking that the shrub flourished so extensively on the northern coasts of the island, as to form large forests occupying an extensive arid track of country, in the neighbourhood of Cape La Grange, and the immediate vicinity of the town of Port du Paix. It is there known by the name of "Thé du Port de Paix," from an infusion made by the inhabitants from the leaves. He adds, in a note, that it was very plentiful in the island of Eleutheria, and was distinguished by certain pharmacologists by the term Cortex Eleutheriæ.‡

The comparative rarity of this species of Croton, with the difficulty of obtaining authentic specimens, has rendered it very imperfectly understood; a wide diversity of opinion existing among botanical writers, with reference to it constituting a distinct species, or only a variety of the *Croton lineare* of Jacquin. The delineation of the plant in Catesby's work is of such an indifferent character as to lead Lindley to question to what Croton it could belong.§ By the majority it has been confounded with Jacquin's plant. The general habit, form of leaves, and other peculiar characters however, obviously separate it from this and all other species of *Croton;* so much so, that when placed in comparison no question could arise about the recognition of their specific differences. The following remarks by Pereira indicated the doubt and obscurity in which these details were involved. He observes that the plant called by Linnæus "*Croton Cascarilla* was regarded for many years as the source of our Cascarilla bark. In 1787, Dr. Wright declared that Linnæus's *Croton Cascarilla* is the wild Rosemary shrub of Jamaica, the bark of which has none of the sensible qualities of Cascarilla. It appears however that the wild Rosemary shrub of Jamaica is the *Croton lineare* of Jacquin, and that some botanists are not quite decided whether we ought to regard it as a variety merely of, or a distinct species from, the *Croton Cascarilla* of Linnæus. Will-

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* Vol. ii. t. 46. † Page 207. ‡ Vol. ii. p. 174. t. 103.

§ It is also to be noticed that it is impossible to say what the plant is, that Catesby figured; for I know of no Croton, nor indeed any other plant, to which it can belong. ('Flora Medica,' p. 179.)

denow considered it to be a variety; Sprengel a distinct species; Don says it is identical with Linnæus's plant. It is remarkable, however, that the specimen in the Linnæan Herbarium is, according to Mr. Don, *C. lineare*, and we are therefore in want of a good botanical description of the plant alluded to by Catesby."* This desideratum has lately been supplied by the excellent Paper of Mr. Bennett, in the 'Journal of the Proceedings of the Linnean Society.'

Guibourt, in his 'Histoire des Drogues,'† appears to incline to the opinion that this species was the one formerly supposed to supply the markets with the article of commerce, although he considers it now to be chiefly yielded by the *C. Eluteria* of Swartz, the production from which, however, as I have previously remarked, was not the case.

Of this Croton, a few plants only were discovered growing at the eastern extremity of the island of New Providence, among the interstices of limestone rocks skirting the beach, it apparently delighting in dry localities, exposed to the influence of the regular sea breezes. With a solitary exception, all partook of the habit of bushy shrubs, from 4–6 feet in height, much branched, with a peculiar pale or greyish-green stem. The epidermis was destitute of lichens, and the white rugous patches, so frequently met with in other species. The branchlets were of a pale or orange-yellow, clothed with pubescence similar to that on the leaves. The inflorescence consisted of numerous simple spikes, invariably terminal, with male and female subsessile flowers on each spike, the small white petals of which were sometimes tinged by a faint yellow hue. They generally appeared in March and April, and when fully evolved emitted a very fragrant perfume. The fruit, a tricoccous capsule, deeply furrowed, about the dimensions of a pea, with a pale yellow more or less rugous, pubescent pericarp, clothed by minute stellate hairy scales, is divided into the ordinary number of cells, each containing a small brown shining seed of variable proportions (1–2½ lines long), externally convex and flattened on each side, so as to form an angular ridge. They attain maturity in May and June. The leaves are petiolate, glandular at base, narrow-lanceolate, sharp-pointed, flat or slightly waved at the margins, tapering towards both extremities, smooth, yellowish or rusty green on their upper surface, pale yellow beneath, and densely tomentose, being covered with numerous intricate stellate hairs.

The cortical layers in the younger shrubs are of a pale, or greyish-green colour, but in those of an arborescent size become changed to a dull red. The dried bark is deficient in the warm aromatic flavour of the *C. Eluteria*, Benn., but appears to be endowed with more bitter extractive matter. The absence of the whitish epidermoid stains, and parasitical cryptogams, the peculiar nodulate character of the stems and greyish-coloured inner bark, will serve to distinguish it from that of *C. Eluteria*, Benn.

According to local traditions the Carib populations highly valued the entire plant, and also that of the *Croton lineare*, Jacq., both of which exhaled a grateful spicy odour, qualities that invariably command the regard and esteem of most barbarous tribes. These products they rendered subservient to a variety of useful purposes, of which the process of fumigating, comprised one of their favourite modes of appliance. European colonists subsequently obtained the knowledge of their medicinal virtues from these sources. They macerated the fresh cortex in wine or spirits, and thus prepared a palatable and pleasant tonic for the relief of dyspepsia, and loss of appetite. In St. Domingo the negro inhabitants have designated the shrub by the name of Port de Paix Sage. The beverage termed "Thé du Port de Paix" is made by

* Medical Gazette,' vol. xx. p. 847.

† Ed. 4, vol. ii. p. 340.

infusing the fresh leaves in boiling water, which, previous to use, required to be well strained, otherwise irritation of the throat would be induced. The agreeable aromatic taste of this infusion had doubtless suggested its employment as a stimulant and stomachic in functional derangements of the stomach and bowels, and the nervous lassitude or debility, that so frequently ensues as the sequel of endemic febrile affections.

V. The Rosemary-leaved Cascarilla.

(*Croton lineare*, Jacq.)

Ricino affinis odorifera fruticosa major rosmarini folio, fructu tricocco albido, *Sloane, Hist. Jamaica*, 1, *p.* 133, *t.* 86, *f.* 1.

Croton fruticulosum; foliis longis, angustis, subtus incanis, margine reflexis, *Browne, Hist. Jamaica, p.* 347.

Clutia Cascarilla, *Linn. Amœnitat. Acad. vol.* v. *p.* 411.

Croton lineare, *Jacquin, Stirp. American. p.* 256, *t.* 162, *f.* 4; *Pict. p.* 124, *t.* 263, *f.* 80.

Croton Cascarilla, *Woodville, Med. Botany, ed.* 1, *vol.* iii. *p.* 116, *t.* 41.

Croton lineare, *Benn. Journ. Proc. Linn. Soc., vol.* iv. *p.* 30.

This species is indigenous to most of the Bahama and West India islands, where it is known by the title of Spanish or wild Rosemary bush, from the leaves and other portions of the shrub resembling those of the common Rosemary (*Rosmarinus officinalis*, Linn.); although every sweet-scented plant of the genus was formerly so designated in Jamaica, irrespective of this supposed similarity. It is also indigenous to the southern provinces of North America, whence specimens collected by Michaux were transmitted to the British Museum, under the erroneous title of *Croton Cascarilla*. Among the Creole population it enjoyed a wide repute for its efficiency in the cure of various maladies. In the Bahamas it is met with under the form of a low scrubby bush, seldom exceeding 3–4 feet in height, growing in waste, arid places, or by the roadsides. The stems, sometimes white, or of a peculiar greyish-brown colour, occasionally marked by white rugous stains on the epidermis, are always more or less shrubby and branched, seldom assuming an arborescent character, although stated to attain an altitude of seven or eight feet in Jamaica. The branchlets are white, or of a pale or orange-yellow hue, partially covered with stellate hairs. The leaves $\frac{1}{5}$–$\frac{1}{3}$ inch broad, and from 1–$2\frac{1}{2}$ inches long, are nearly sessile, linear, blunt, more or less reflected at the margins, deeply channelled green and smooth above, beneath white or pale-yellow, very densely pubescent, being clothed by numerous intricate stellate hairs. The inflorescence is axillary and terminal. Odoriferous, subsessile white flowers, occasionally tinged by yellow-green at their apices, are sparingly attached to simple spikes, the male and female being set on distinct spikes. The fruit, the ordinary trilobular capsule of the genus, containing three small, deep-brown, ovoid seeds, is about half the size of the common pea. The pericarp, of an orange-yellow hue, is rugous, and thickly studded with stellate hairy scales. The fruit ripens in May and June. Similar to the preceding species, the entire plant, when rubbed between the hands, imparts a pleasant aromatic fragrance, which continues for some time. The cortical layers of the bark are of a greyish-brown colour, and of an agreeable bitter flavour, but do not possess the warm aromatic aroma of those of the *Croton Eluteria*, Benn., and are also much inferior in quality to the cortex of the *C. Cascarilla*, Benn. According to Swartz, the leaves become more largely developed in the inland districts, than in those adjoining the seacoast. Sloane, in his 'History of Jamaica,' first noticed this plant under the description of "*Ricino affinis odorifera fruticosa major rosmarini folio;*" and Patrick

Browne, in his work on Jamaica, by that of *Croton fruticulosum*. In the fifth volume of the 'Amœnitates Academicæ' of Linnæus, it was termed *Cluytia Cascarilla*. Jacquin, however, conferred upon it the more appropriate title of *Croton lineare*, having both described and figured it in his work on American plants. By many authorities this species has been confounded with the *Croton Cascarilla* of Bennett, a product widely dissimilar in every respect, not only as regards the habit, arborescent stem, but in the distinctive character of the petiolate, lanceolate and sharp-pointed leaves of the latter. Wright, in the 'London Medical Journal,'* has incorrectly referred it to the *C. Cascarilla* of Linnæus, which designation Mr. Bennett has clearly pointed out was originally founded on Catesby's representation of the Bahama specimen. Woodville has also committed the same mistake, and erroneously delineated it under the name of *Croton Cascarilla*, in his 'Medical Botany.' Under the article *Croton*, in 'Rees's Cyclopædia,' the diagnoses of these two species has, however, been clearly defined, as would appear by the following statement:—"Lamarck was justified, by well preserved specimens, in the herbarium of Jussieu, that this plant (*C. lineare*) was specifically distinct from the preceding (*C. Cascarilla*), though they have been confounded by Linnæus. The author of 'Hortus Kewensis' (Aiton) appears to have been of the same opinion, by his excluding the synonyms of Catesby and Plumier."† Grisebach, the most recent authority on this subject, however, describes this plant as a mere variety of the *C. Cascarilla*, Linn.‡

Under the form of an infusion or decoction, different portions of this Croton appear to have been employed as medicinal agents by European colonists at an early date. Barham considered the dried leaves in powder, to constitute a specific in colic, and to equal in virtue, as a stimulant and stomachic, those of our common Rosemary. The young branchlets and leaves, under the form of a decoction, were used as fomentations in painful tumors, neuralgia, and muscular rheumatism, and likewise entered as a principal ingredient into the composition of the warm medicated baths in popular usance. During my residence in New Providence, I was informed that an infusion of this plant was deemed a successful remedy in the treatment of ulcers and other cutaneous affections, and administered internally in copious warm draughts to promote diaphoresis in the first stages of febrile and other inflammatory complaints, both by the creole negro soldiers, and the inhabitants of the island. This species appears to have been introduced into England by Dr. Houston prior to 1733, and was subsequently cultivated in some of the public gardens.

VI. Sea-side Balsam or Sage.

(*Croton balsamiferum*, Linn.)

Croton balsamiferum, *Linn. Mant.* 125.

Croton balsamiferum, *Jacquin, American. t.* 162, *f.* 3; *Pict. p.* 124–242. *Hort. Botan. Vindob. vol.* iii. *t.* 46.

Croton fruticosum erectum, et subvillosum, foliis cordato-acuminatis, spicis terminalibus, *Browne, Hist. Jam., p.* 347.

Croton balsamifer, *Grisebach, Flor. Brit. W. I. Isl. vol.* i. *p.* 38.

This well-marked species flourishes in many of the West India islands, as also in several of the Bahamas. In that of New Providence it is usually found, more or less under cultivation in the gardens, or on the outskirts of the town of Nassau; hence, probably it has been introduced and naturalized from other localities. Tradition also asserts that this comprehended one,

* Vol. viii. p. 249. † Vol. x.

‡ *B. linearis*, Jac., Flor. B. W. Ind. Islands, vol. i. p. 38.

G. Jarman del. et sc.

among other favourite plants, resorted to by the Caribs for remedial purposes. Its reputation as a medicine has not declined since their extinction, for manifold preparations from the shrub still attest the popular esteem in which it is held by the various populations of the above islands.

Owing either to its odoriferous qualities, or from an imaginary resemblance to the rugose leaves of our garden Sage (*Salvia officinalis*), this and some other Crotons have received the title of Sage or Sea-side Sage. Hence an infusion of the leaves, prepared in a similar manner to that from the *Salvia* in England and America, is also termed Sage-tea. The designation of Balsam, frequently conjoined with it, appears to be derived from the circumstance of a thick, yellowish aromatic sap exuding from the extremities of the broken branches, or wherever the stem has been wounded. Jacquin has furnished brief detailed outlines of this species in several of his works, remarking that it was called in Martinique by the name of *Petit Beaume*, or Little Balsam.

The stem is erect, with a grey or pale-brown epidermis. Branchlets pale-yellow, more or less clothed with stellate hairs. Leaves long-petiolate, broad, ovate-lanceolate, pointed, perforated by pellucid dots, pale-green, smooth, or partially covered with stellate down on upper surface, pale-yellow, hoary, densely studded with intricate stellate hairs, with two urceolate glands at the base beneath. Spike simple. Inflorescence terminal, flowers white, sometimes faintly tinged with yellow, male and female on same spike. Fruit consists of an oblong roundish capsule, one-third less in size than that of the *C. Eluteria*, Benn. Pericarp rugose, covered with numerous stellate hairs. Seeds 1–2½ lines long, ovoid, deep-brown, and shining, one in each cell. Fruit becomes mature about May or June.

In several of the West India and Bahama islands, different parts of this product are rendered applicable to the cure of endemic diseases. The young leaves and branchlets introduced into warm baths are supposed to communicate their agreeable fragrance and medicinal virtues to the water, and these act in a remedial mode through the cutaneous system, while a decoction of the same is employed as a fomentation in arthritic swellings of the joints, and as a stimulant lotion to indolent sores, and chronic ulcers of the leg. Similar to the Sage-tea, in English and American use, an infusion made from the tender leaves, and drunk in copious warm draughts, is administered to procure diaphoresis in fevers, and local inflammatory complaints. Probably their stimulant, aromatic qualities render them more agreeable to the stomach, and consequently allay the nausea and gastric irritation that often accompanies the invasion of these tropical affections.

In New Providence the bruised branches and balsamic exudation, conjoined with the infused leaves, have been found beneficial in bronchitis, and as a gargle in some morbid conditions of the pharynx and mouth. A cordial liquor, termed *Eau de Mantes*, is said to be distilled from the yellow, glutinous sap, with spirits of wine, in Martinique, and valued as a medicine in the treatment of certain uterine irregularities, independently of its appropriation as an article for domestic use. Neither the bark of this species, nor that of the *C. lineare*, Jacq., are apparently held in any esteem as curative agents in the Bahamas, and therefore are never diverted to these purposes.

Fig. 1. *Croton Cascarilla*, Benn., natural size. 4. Fruit, natural size. 5. Seeds, natural size. 6. Stellate hairs from leaf, magnified.

Fig. 2. *Croton lineare*, Jacq. (Jamaica), natural size. 7. Stellate hairs from leaf, magnified.

Fig. 3. *Croton lineare*, var. *b*. (Bahama), small variety, natural size.

USE OF METHYLATED SPIRIT IN PHARMACY.

TO THE EDITOR OF THE 'PHARMACEUTICAL JOURNAL.'

Sir,—It is perhaps well that the solution of public questions is usually effected by slow degrees, since the final settlement may be trusted to be as sure as its coming has been tardy. The methylated spirit nuisance had not even the claim to be a time-honoured abuse; but by simple virtue of its vested right as being an abuse, it has so far defied attacks, which are based equally upon the interest of public health and of trade morality.

But we now see the question begin to ripen. One of its most important phases is the purely chemical one, and upon this the last few days have supplied most material evidence. Mr. H. N. Draper, who approaches the subject in order to investigate an abstract chemical question, and not to confirm any foregone conclusions, announces that wood naphtha itself may be so purified as to be indistinguishable from spirit of wine. (*Chem. News, Oct.* 18.)

Since the tests for detecting their admixture are admittedly only the senses of taste and smell, it is not improbable that attempts will be made to controvert Mr. Draper's statement. But this controversy must not be a question of mere traces of flavour. It matters not whether methylated spirit be "cleaned" by one operation or by a series of such, nor whether the final trace of flavour be inseparable.

In the latter case, it may be equally improved out of existence by the addition of a minute quantity of some aromatic.

Mr. Draper's belief that methyl alcohol, as studied by chemists hitherto, has been a mixture of that substance with highly-pungent oils, appears to be fully justified. A new and rational method for their separation has been devised, and brings us to new consequences. I know that the method of filtering after dilution with water is highly valued by some makers of wood naphtha.

Assuming every position of Mr. Draper to be proved, I may allude to one consequence which will not follow. It will *not* follow that Mr. G. Phillips, or the three commissioners who concurred with him in recommending the present mode of defiling untaxed spirit, have shown an ignorance of any chemical principle or fact. They were justified by existing chemical knowledge in the method devised; but the progress of time, and the practical offer of £250,000 per annum of evaded duty, have produced a change.

In the course of a copious correspondence upon this subject, I meet with gentlemen who approach it from odd points of view, though I am bound to give them credit for the best intentions. One thinks it "tempting Providence" to interfere with the chance of tolerably pure spirit free of duty; another, as a free-trader, objects to the tax upon spirit altogether.

Now, although I first gave attention to this question because it affected the interest of the trade, I cannot consent now to lay down the other question, of how it affects the consumer of medicines. Upon this, the minute of the College of Physicians, forbidding entirely the use of methylated spirit, gives us an intelligible stand-point.

If we are to decline allegiance to the College, let it be upon some question upon which we can with decency publish our grounds for refusal.

That the College were abundantly justified in their prohibition, I have been convinced by the reply given me by every medical man to whom I have "stated a case" in the following terms:—"It is admitted that methylated preparations often cause sickness: suppose a patient in a state of collapse, and you give a stimulant which is methylated and causes vomiting—may that turn the scale between life and death?" The answer has invariably been, "Certainly it may."

Let those who incline to look leniently upon the abuse, recognise the position they are taking, which is the assertion that a substance is good and pure enough for physic, which is so defiled that no one will drink it as a beverage.

But I trust you will have some information to convey of action on the part of the Council, and am Yours respectfully,

R. Reynolds.

Leeds, 13, *Briggate*, *Oct.* 1862.

PURIFICATION OF PYROXYLIC SPIRIT.

BY HARRY NAPIER DRAPER, F.C.S.

In a case (No. 513, Class 2), in the Exhibition at South Kensington, is to be seen, or was to be seen last August, a large glass jar, containing, perhaps, the most remarkable of the many products of modern chemistry which constitute the attractions of the Eastern Annexe. Just at this time, in its connection with a subject of vital importance to Pharmaceutical chemists, this single bottle should be to them the most interesting object in the entire chemical collection; and yet, although I have been not a little surprised that, beyond a mere passing notice in the 'Chemical News' of its existence, it has been wholly overlooked, those who read this note will be still more astonished that it should not before have attracted attention in connection with the vexed question of "cleaned" methylated spirit.

This bottle holds, perhaps, a gallon of fluid, and has a boldly-printed label, "Potable Wood Naphtha." Through the courtesy of the Class Superintendent, I obtained a specimen of this liquid, large enough to serve for several experiments, and to leave sufficient to satisfy the curiosity of any one who may wish to see it. It is colourless, its odour suggests nothing but alcohol, and its taste but the very faintest suspicion of pyroxylic spirit. It has a specific gravity of ·805. When diluted, both the smell and taste of wood-spirit become more perceptible; but so little so, that the slightest addition of an aromatic essential oil is enough to conceal them. I am convinced that there is no single tincture in the Pharmacopœia which, if made with this spirit, could be distinguished from the official preparation by its sensible properties.

I ascertained, upon further inquiry, that this spirit was prepared under a patent, taken out during this year; and, as I have a copy of the specification before me, I will give an outline of the patentee's method of "Treating Wood and other Vegetable Spirit," premising that the specification offers no evidence that the patentee considered wood-spirit as anything but some very impure form of ordinary alcohol, which, like that prepared from beet-root and madder, it would be desirable to render potable. Specimens of beet and madder spirit are, in fact, exhibited in the same case.

The wood-spirit is first diluted with from 75 to 80 per cent. of water, allowed to repose for twenty-four hours, and then passed through a succession of filters containing coarsely-granulated wood charcoal. The only novelty claimed by the patentee is the very ingenious arrangement of the filters, which are so placed that the spirit in the process of purification shall continually come in contact with cleaner charcoal, and that one, the first of the series, can be replaced when foul by a new one, not in its place, but as the last of the series. After purification, the spirit is of course distilled.

An experiment on the small scale with a series of seven filters—the patentee recommends fifteen—gave spirit nearly as free from taste and smell as that which I obtained at the Exhibition, and I have little doubt that even the latter can be still further deodorized.

Pure methylated alcohol has hitherto been believed to possess, as a reference to any treatise on chemistry will demonstrate, an odour and taste peculiar to, and inseparable from, itself. Resting upon this hypothesis, and upon its remarkable chemical analogy to vinic alcohol, the Excise authorities felt themselves secure in permitting the untaxed sale of ordinary alcohol, which had been mixed with the methyl compound. "In fact," write Messrs. Graham, Hoffman, and Redwood, in

their report on the subject to the Chairman of Inland Revenue,* "the more highly purified the naphtha is with which the spirit is mixed, the more difficult will it be to effect the alteration of this mixture in the way contemplated by any chemical process."

But this hypothesis is now, I submit, no longer tenable. We have in this specimen in the Exhibition, in the specification of the patentee who exhibits it, and which details minutely a process which any chemist can successfully repeat, and in the undeniable fact, that "cleaned" methylated spirit is an article of every-day application, proof that not only can the mixture, containing but 10 per cent. of methylic alcohol, be successfully purified, but that wood-spirit itself, as found in commerce, can be made to so closely resemble wine alcohol, as to be, when undiluted, indistinguishable from it, save to the most sensitive and tutored smell and taste.

Now, while I am of opinion that in its present form the patented process just described is not adapted to the purification of wood-spirit on a manufacturing scale, I cannot avoid also expressing my belief that Mr. Phillips, when deprecating the danger arising to the Revenue from the possibility of rendering methylated spirit potable, adopts too confident a tone. It would have been thought scarcely necessary to remind any one who knows what has been the progress of chemical science during the past ten years, that that which to-day is only practicable as a laboratory experiment, may to-morrow, by some simple modification, become not only practicable on a large scale, but a profitable field of manufacturing enterprise. Nor is it probable that, in the face of the indignant letters which have thronged the pages of the 'Pharmaceutical Journal' for the past three months, the chemist of the Inland Revenue would write in October, as he did in March, alluding to some discarded patent having a like object—that there are considerations of a recondite nature "which alone would lead me to doubt that danger to the Revenue would accrue from the process in question."†

Turning aside, however, from the unpleasant part of the subject, it is satisfactory to find that a process having a wholly practical object points to a new scientific truth. It is impossible—it is so to me, at least—to avoid the conclusion, that the body which is described by chemists as methylic alcohol, is methylic alcohol *plus* a minute quantity of a strongly odorous hydrocarbon (probably the same which exists in the crude wood-spirit to a large extent), which has so great an affinity for the alcohol, that not only does the ordinary process of purification, by dilution with water and distillation, fail to remove it, but that the most powerful oxidizing agents are equally unsuccessful. If the dilution, however, be followed by an interval of repose, and that then the fluid be percolated through charcoal at a low temperature, and in such a manner that the partially-purified filtrate shall not redissolve the separated hydrocarbon, the result is a body which, while we can no longer attribute to it the peculiarities of taste and smell by which methyl-alcohol is now recognised, and which it is described by chemical writers as possessing, is still methyl-alcohol in all its chemical characteristics and reactions.

I have yet to complete researches, with the object of placing this hypothesis beyond dispute; but as just now the subject possesses more than ordinary interest, I have thought it well to state the conclusions at which I have already arrived.

Dublin, October 11, 1862.

THE INDIAN REMEDY FOR SMALLPOX.

Some time since we noticed the new remedy for variola in use among the Indians of Nova Scotia. We derived our information of its virtues from a notice of it in one of our foreign exchanges. In England it had attracted so much notice as that its virtues were to be thoroughly tested. At a recent meeting of the Medical Society of Nova Scotia, held at Halifax, the subject was discussed, and a resolution passed to the effect that there were not "any reliable data upon which to ground any opinion in favour of its value as a remedial agent."—*Med. and Surgical Reporter and British American Journal.*

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* *Vide* Pharmaceutical Journal, Vol. IV. (New Series), p. 171.

† *Vide* Pharmaceutical Journal, Vol. XV. p. 30.

ON THE PULVERIZATION OF CAMPHOR.

BY M. PISK.

The author recommends the following process for obtaining pulverulent camphor :— Five hundred grammes of camphor are dissolved in a litre of spirit of wine, and the solution poured in a thin stream, and during constant stirring, into a mixture of four grammes of carbonate of magnesia with four litres of water. The precipitate is collected on a filter and dried in the air. The camphor is thus obtained in the form of a light, spongy substance, easily reduced into a fine powder, which may be kept in a cool, dark place, without aggregating in crystalline lumps, a disadvantage attending camphor powdered in the ordinary way. The small portion of carbonate of magnesia present, to which it owes its keeping properties, is not sufficient to cause inconvenience in applying it to medical purposes.—*Répertoire de Chimie.*

ANTIDOTE FOR STRYCHNINE.

BY M. KURZAK.

The experiments instituted by the author upon rabbits and dogs, place beyond a doubt the good effects of tannin as an antidote for strychnine. M. Kurzak concludes from his experiments that if administered in time, tannin is an excellent antidote for this subtle poison. It is necessary to give twenty or twenty-five times as much of the antidote as of the poison ; and in actual cases of poisoning it would be prudent to give much more. Infusion of galls may also be given with advantage. An infusion of black tea even is efficacious if the dose of strychnine taken was small ; coffee has the same property, but in a less degree. Oak bark, which contains 8·5 per cent. of tannin, may also be given in decoction ; it is convenient on account of the ease with which it may be procured. The author also recommends as applicable to the same purpose from their richness in tannin, acorns, chestnut bark, willow bark, tormentilla root, bistort root, and the root of the carnation.—*Journal de Chimie Médicale.*

ON THE COMPOSITION OF THE PRECIPITATES PRODUCED BY MINERAL ACIDS IN SOLUTIONS OF TARTAR EMETIC.

BY M. ZEYER.

The mineral acids, it is generally known, produce white precipitates in solution of tartar emetic. Basic salts are deposited, containing no potash ; the base is always oxide of antimony, combined in various proportions with the mineral acid as well as tartaric acid. The acid is not present as a simple mixture, but is an essential part of the precipitate. The solubility of these precipitates in the mineral acids employed, prevent the complete separation of the oxide of antimony from the solution. Prolonged washing removes all the acid, and a portion of the oxide of antimony, from the precipitate.—*Wittstein's 'Vierteljahr.'*

ON LACTATE OF IRON.

BY M. STANISLAUS MARTIN.

It is well known that cane-sugar has the property of reducing some metallic oxides, and that certain salts undergo decomposition by its influence.

In 1834 the author showed that cane-sugar in contact with subnitrate of bismuth undergoes modification, upon which Mr. Boetter has founded his test for sugar in diabetic urine. Lactate of iron has also the property of converting cane-sugar into grape. This may be observed by dissolving in one hundred parts of simple syrup fifteen parts of lactate of iron. After some time the mixture becomes coloured, and strongly reddens litmus paper ; in this state the sugar has become uncrystallizable, and by means of the polariscope it will be readily seen that the sugar is transformed into glucose.—*Journal de Chimie Médicale.*

TO CORRESPONDENTS.

Sarracenia purpurea.—Mr. H. Chalmers Miles, in a communcation to the 'Lancet,' October 18, has again brought the claims of this Indian remedy for smallpox before the Medical Profession. Since our notice of this reputed remedy (see vol. iii., 2nd ser., p. 323, and vol. iv. p. 87), some doubt has arisen in certain quarters as to which part of the plant possessed the most activity. Mr. Miles states, as the result of his experiments, that although the leaves possess similar properties to the root, he considers the latter to be the more efficacious. The method of making the decoction, recommended by Mr. Miles, is to slice from one to two ounces of the dried root into thin pieces, add a quart of cold water, and permit the liquor to simmer gently until it has lost one-fourth of its weight. Dose, a large wine-glassful.

Triticum repens.—The infusion of this grass is made by digesting an ounce of the cut and dried stem in a pint of boiling water for one hour. Dose, half a pint to a pint in the twenty-four hours, taken at intervals. The form of decoction is generally preferred, and is made in the same proportions.

B. (Stourbridge), *Silvering Glass.*—A full description of Petitjean's process will be found in this Journal, Vol. XVI. p. 149. In this process the deoxidation of the silver is effected by means of the tartaric acid, and the silver deposited in the metallic state.

An Apprentice (Carlisle).—(1) Pharmaceutical Latin Grammar, (Groombridge), price 5*s.* (2) The work is not yet published.

S. S. L.—A solution of Cobalt would be permanent (see p. 92 of our present volume).

H. L.—The *Tinctura Pruni Virginianæ* may be made in the proportion of two ounces of the wild-cherry bark to twenty ounces of proof spirit; prepare by percolation.

Pharmakon (Leicester).—Apply by letter to the Secretary of the Royal College of Physicians, Pall Mall East, London, S.W.

A Young Apprentice (Strood).—Fownes's 'Manual of Chemistry,' price 12*s.* 6*d.*

Student (Birmingham); and *A. A.* (Oxford).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

Mr. H. Whitfield (Worcester) is thanked for his communication on the use of Methylated Spirit. See page 200.

A Registered Apprentice (Wakefield).—1. Parnell's Elements of Chemical Analysis. 2. Knight and Sons, Foster Lane. 3. The articles referred to may be obtained of any ironmonger.

W. W. (Glasgow).—The substance called "Eye Stone" is a small calcareous stone, found in the shell of some of the Mollusca, and was formerly used for taking substances from between the lid and ball of the eye,—hence its name.

M. R. S. (Gravesend).—"Steedman's Powders" cannot be legally sold singly without the patent medicine stamp.

An Intending Candidate (Southport).—No further acquaintance with medicinal plants is required than can be readily obtained during an apprenticeship.

W. G. A. (Bristol).—The action of sugar in augmenting the solubility of lime in water is well known, the compound so formed being sometimes called "sucrate of lime," or "saccharated lime." This solution is decomposed on exposure to the air, from absorption of carbonic acid, the product assuming different appearances according to the amount of carbonic acid absorbed. When two-thirds of the lime has been converted into carbonate while one-third remains combined with the lime, the liquid solidifies to a jelly.

Erratum.—'Pharmaceutical Journal,' p. 148, line 9 from the bottom, read "Sloanean," instead of "Linnean."

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, Elias Bremridge, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. VI.—DECEMBER 1st, 1862.

THE BRITISH PHARMACOPŒIA AND ITS WEIGHTS AND MEASURES.

We may now hope for the speedy publication of the British Pharmacopœia, the question of "Pharmaceutical Weights and Measures" having been reconsidered, and, we trust, definitively settled, as far as the forthcoming work is concerned. The previously proposed alteration in the value of the grain was so generally objected to, that at a meeting of the General Council of Medical Education and Registration, held on the 28th of October, it was resolved, "That so much of the Report of the Pharmacopœia Committee, which was presented to the General Council on the 14th of May, 1862, as relates to the system of weights and measures, be reconsidered." In thus entering upon the reconsideration of this subject, the Medical Council had several communications before them from the Executive Committee, the Royal Colleges of Physicians of London and Edinburgh, the Pharmacopœia Sub-Committees of London, Edinburgh, and Dublin, and the Council of the Pharmaceutical Society in Edinburgh.

The Executive Committee thought there were "grave reasons for considering more maturely the expediency of introducing, under the authority of the Medical Council, the proposed changes of the weights used in pharmacy throughout the empire;" and suggested that the Astronomer Royal, Sir John Herschel, and Professor Miller of Cambridge, be requested to favour the Committee with their opinions on the subject.

The Royal College of Physicians of London were of opinion that, however desirable it may be to substitute the avoirdupois pound for the troy pound, it is *not* desirable to introduce a new grain, differing from the standard grain, which has been so long in general use, and is established by Act of Parliament.

The Royal College of Physicians of Edinburgh stated:—1. That the existing system is so faulty and unsatisfactory, that some change is required in it. 2. That the change suggested in the report of the Pharmacopœia Committee appears to the College to be an improvement. 3. That the metrical decimal system having been recommended by a Committee of the House of Commons, it appears to the College that it would be well were the Medical Council at

once to take the lead in inaugurating the decimal system, by introducing it into the new Pharmacopœia.

The London Pharmacopœia Sub-Committee gave their opinion as follows:—

1. "The London Sub-Committee is willing to relinquish the new (proposed) grain.
2. "The London Sub-Committee thinks it premature to adopt the metrical system of weights and measures, as it has not yet been sanctioned by the Legislature.
3. "As some decimal system will probably ere long be adopted by the Legislature, the London Sub-Committee does not think it advisable to introduce any new system of weights and measures at the present time.
4. "Considering that two of the three National Pharmacopœias employ the Apothecaries' (Troy) weight, the London Sub-Committee is of opinion that that system should be ordered to be used in the British Pharmacopœia.
5. "The alteration of the weights from the avoirdupois to the Apothecaries' weights will of necessity involve a very extensive revision of the manuscript of the British Pharmacopœia."

The Edinburgh Pharmacopœia Sub-Committee sent a long document, in which the previous decisions of the Pharmacopœia Committee and of the General Council are justified; and they conclude by saying, "The Edinburgh Sub-Committee will hail with pleasure the occasion when men of science will persuade trade, commerce, and Government that a decimal system of weights and measures is the most truly scientific of all, as well as the most facile in practice. So far as pharmacy and medical practice are concerned, men of science will meet with no opposition to a really scientific system such as that; and no new obstacle will be created by the system which has been adopted in the meantime for pharmacy by the Pharmacopœia Committee and the General Medical Council, *as the only eligible mode of reconciling real existing discrepancies, and getting rid of actual serious inconvenience.*"

The Dublin Pharmacopœia Sub-Committee stated that they fully agreed in opinion with the Edinburgh Sub-Committee.

The Council of the Pharmaceutical Society in Edinburgh stated, "That as the United Committee have already decided that the new Pharmacopœia be published, substituting the avoirdupois weight as a standard instead of the troy, the Council much desire that this should be adhered to; and that in the meantime, until a decimal system be decided upon for the country at large by Government, no change to the metrical form be made."

With these several opinions before them, the General Council, after having negatived a motion for adopting the French decimal system of weights and measures, and also a motion—

"That all weights below the avoirdupois pound, excepting grains, or multiples or parts of grains, be omitted from the British Pharmacopœia, whereby the grain weights in use may be uniformly divided or multiplied duodecimally or decimally, and the inconvenient division of the avoirdupois ounce into 437·5 grains and its subdivisions will be avoided,"—

finally resolved,

> "*That the weights used in the British Pharmacopœia be the Imperial or avoirdupois pound, ounce, and grain; and that the terms 'drachm' and 'scruple,' as designating specific weights, be discontinued.*"

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *5th November*, 1862,

Present—Messrs. Bird, Bottle, Bucklee, J. B. Edwards, Evans, Hanbury, Herring, Hills, Maekay, Morson, Sandford, Savage, Squire, Standring, and Waugh,—the following were elected

MEMBERS.

FARNHAM .....William Frederick Underdown.
SOUTHAMPTON .....George Manby.

The following having paid their arrears and subscriptions for the eurrent year have been restored to Membership:—

AYR.....William Helmrich.
BARNSTAPLE .....Edward Parsons.
BARTON ON HUMBER.....Charles Crowder.
BIRMINGHAM.....Matthew Hipkins.
CARDIFF.....William Luke Evans.
CREDITON .....John Melhuish.
HULL .....Joseph Bishop Kirton.
KENILWORTH.....Robert William Hubbard.
LEEDS.....Daniel Hellowell.
MACCLESFIELD .....Henry Hodkinson.
OXFORD .....Isaac West.
RAYLEIGH .....Richard Harrington.
READING .....Henry Martyn Heelas.
SURBITON .....Charles Lowe.

On the Report of the Board of Examiners, Mr. Charles Umney was eleeted to the Junior Bell Scholarship, and the Counеil granted him free Laboratory instruction during the session.

Resolved, that in future, applications from eandidates for the Jacob Bell Memorial Scholarships shall be made on or before the 1st of August, and that the examination be conducted during the same month.

The sum of £15 was granted from the Benevolent Fund to the widow of a member.

List of Subscriptions received and promised (including those announced in March last) towards defraying the expenses of the Committee in providing the necessary fittings and attendance in connection with the Pharmaceutical Collection at the International Exhibition:—

	£	s.	d.
Allchin, Alfred, Richmond Road, Barnsbury.....	1	1	0
Allen and Co., Charterhouse Square	1	1	0
Arnold, Adolphus, Guernsey	0	10	0
Attfield, J., Director of the Pharmaceutical Laboratory	1	1	0
Barron, Frederick, 2, Bush Lane	1	1	0
Barron, Harvey, and Co., 6, Giltspur Street	1	1	0
Baiss, Brothers, 102, Leadenhall Street	1	1	0
" " " 2nd Subseription...	1	1	0
Barnard, John, 31, Upper Gower Street	1	1	0
Barnes, J. B., Trevor Terrace, Knightsbridge	1	1	0
Beaufoy and Co., South Lambeth	1	1	0
Bell, John, and Co., 338, Oxford Street	1	1	0
Bentley, Professor, 17, Bloomsbury Square	1	1	0
" " " 2nd Subscription...	1	1	0
		R	2

	£	s.	d.
Bird, Augustus, 22, High Street, Kensington	1	1	0
2nd Subscription...	1	1	0
Bird, William L., 42, Castle Street East	1	1	0
Bishop, Alfred, Speck's Fields, Mile End	1	1	0
Blake, Sandford, and Blake, 47, Piccadilly	1	1	0
2nd Subscription...	1	1	0
Bottle, Alexander, Dover	1	1	0
Brady, Henry B., Newcastle-on-Tyne	1	1	0
Bremridge, Elias, 17, Bloomsbury Square	1	1	0
Brewer, John W. N. T., 5, Liverpool Street	1	1	0
Buckle, Christopher F., 3, Upper North Place	0	10	6
Bucklee, William H., 86, New Bond Street	1	1	0
Constance, Edward, 37, Leadenhall Street	1	1	0
2nd Subscription...	1	1	0
Corbyn, Messer, Stacey, and Co., 300, Holborn	2	2	0
Craeknell, Charles, 107, Edgware Road	1	1	0
2nd Subscription...	1	1	0
Curtis, Frederiek, and Co., 48, Baker Street	1	1	0
Darby and Gosden, 140, Leadenhall Street	1	1	0
2nd Subscription...	1	1	0
Davenport, John T., 33, Great Russell Street	1	1	0
2nd Subscription...	1	1	0
Davy, Macmurdo, and Co., 100, Upper Thames Street	1	1	0
2nd Subscription...	1	1	0
Deane, Henry, Clapham	1	1	0
2nd Subscription...	1	1	0
Dinneford and Co., 172, New Bond Street	1	1	0
2nd Subscription...	1	1	0
Edwards, George, Dartford	1	1	0
Edwards, J. B., Liverpool	1	1	0
Evans, Lescher, and Evans, 60, Bartholomew Close	1	1	0
Evans, Sons, and Co., Liverpool	1	1	0
2nd Subscription...	1	1	0
Fisher and Haselden, 18, Conduit Street	1	1	0
2nd Subscription...	1	1	0
Groves, Thomas B., Weymouth	1	1	0
Garden, Alexander, 372, Oxford Street	1	1	0
Garle, John, Kilburn	1	1	0
2nd Subscription...	1	1	0
Gilbertson and Sons, Ludgate Hill	1	1	0
Gissing, Thomas W., Wakefield	0	10	0
2nd Subscription...	0	10	0
Hanbury, Daniel Bell, Plough Court	1	1	0
Hanbury, Daniel, Plough Court	1	1	0
2nd Subscription...	1	1	0
Hearon, M'Culloch, and Squire, 5, Coleman Street	2	2	0
Herring and Co., 40, Aldersgate Street	1	1	0
Hill, Arthur S., 11, Little Britain	1	1	0
Hills, Thomas H., 338, Oxford Street	1	1	0
2nd Subscription...	1	1	0
Hogg, Robert, 9, Albion Place, Hyde Park	1	1	0
Hooper, William, 7, Pall Mall East	1	1	0
Hopkins and Williams, 2, Cavendish Street	1	1	0
Horncastle, John, 12, Stanhope Terrace	1	1	0
Horner and Sons, 20, Bucklersbury	1	1	0
Howard, Robert, Stratford	1	1	0
Howlett, Samuel, Mile End	0	16	6
Hulle, Jacob, Battersea	1	1	0

	£	s.	d.
Huskisson and Son, 77, Swinton Street	1	1	0
Johnson, Messrs. H. and S., Liverpool	1	1	0
Lawrence, Henry, 49, High Street, Kensington	0	10	6
Long, Henry, 48, High Street, Notting Hill	1	1	0
Long, Henry, Croydon	1	1	0
Mackay, John, Edinburgh	1	1	0
Meggeson, George, Wandsworth	1	1	0
" " " 2nd Subscription...	1	1	0
Meggeson and Co., 60, Cannon Street	1	1	0
" " "	1	1	0
Mercer, Nathan, Liverpool	0	10	6
Moore, William, Leicester	1	1	0
Morson, T. N. R., 38, Queen Square	1	1	0
" " " 2nd Subscription...	1	1	0
Preston and Sons, 94, St. John Street, Smithfield	1	1	0
Redwood, Professor, 17, Bloomsbury Square	1	1	0
" " " 2nd Subscription...	1	1	0
Savage, W. D., Brighton	1	1	0
Southworth, R. D., Liverpool	0	10	6
Squire, Peter, 277, Oxford Street	1	1	0
" " " 2nd Subscription...	1	1	0
Standring, Thomas, Manchester	1	1	0
Waugh, George, 177, Regent Street	1	1	0
Whitlock, Edwin, Salisbury	1	1	0
Wilkinson, William, Manchester	1	1	0
Wright, Francis, and Co., 11, Old Fish Street	1	1	0
York Glass Company	1	1	0

PHARMACEUTICAL MEETING.

Wednesday, November 5th, 1862.

MR. T. N. R. MORSON, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to the respective donors thereof:—

The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.
The Photographic Journal.
The Technologist.
Répertoire de Chimie.
Pharmaceutisk Tidende. From their respective Editors.
Journal of the Proceedings of the Linnean Society.
Journal of the Chemical Society.
Journal of the Society of Arts.
The Medico-Chirurgical Transactions, Vol. 45. From the respective Societies.
Synthèses de Pharmacie et de Chimie. Par Théophile Gourdin.
Synthèses de Pharmacie et de Chimie. Par J. Brousse.
Svensk Pharmaceutisk, Bibliographi af N. P. Hamberg. From the Authors.
On Cascarilla Plants. By Dr. Daniell. From the Author.
A large Intestinal Calculus from a Horse. From Mr. J. E. Jennings, Southampton.
Specimen of a branch, with fruit, of the Styrax Plant (*Styrax officinale*). From Mr. Daniel Hanbury.
Specimen of *Assafœtida.* From Messrs. Preston and Sons.

PRIZES FOR HERBARIA.

The Bronze Medal for a collection of British Plants, the award of which was announced at the meeting in October, and alluded to in our last number, page 198, was distributed to Mr. Richard Cooper Hopgood, an Associate of the Pharmaceutical Society, residing with Mr. Hopgood, a Medical Practitioner, at Chipping Norton.

In presenting the medal to Mr. Hopgood, the Chairman complimented him upon his success, and trusted that the prizes annually offered by the Council for the best collections of British Plants, would act, even more than they had hitherto done, in encouraging the study of so important a branch of their curriculum, as Botany.

The following communications then took place :—

NOTE ON A LARGE INTESTINAL CALCULUS.

BY MR. ATTFIELD, DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY.

The Calculus presented to the Museum of the Pharmaceutical Society by Mr. Jennings was taken from the intestines of a large cart-horse belonging to Mr. Rice, miller, of Nutshalling (Nursling), near Southampton. In size, form, and colour, it closely resembles an ordinary globular Dutch cheese; but its weight is nine and a half pounds, and its hardness is equal that of Bath or Caen building-stone. Its circumference is twenty-two inches.

An analysis of a section, made in the Society's laboratory, shows that this calculus consists almost entirely of ammonio-phosphate of magnesia ($2MgO, NH_4O,PO_5$), the so-called "triple phosphate." Fragments of hair and vegetable fibre have apparently assisted the crystals of the magnesian salt in forming a compact hard mass, the motion of the animal in walking probably still further solidifying and rounding the ball. The section of the stone shows it to be built up of a series of concentric layers varying in colour from a dirty white to a dark brown, the tints depending on the different amounts of organic matter in the several layers of mineral deposit. The nucleus on which, in this instance, the calculus has been formed, is a small piece of flint, and the section has been so made as to exhibit this pebble *in situ*.

Calculi, similar to the one above described, are not unfrequently found in the intestinal canal of herbivorous animals. Horses engaged in heavy in-door work, and in whose food bran is largely included, are peculiarly subject to them. It was just such a horse that this large calculus was taken from. It was a mill-horse, its food chiefly hay and mill-refuse. The symptoms of its disease were those of colic; its age at death, nine years.

The specimen is interesting on account of its large size and chemical composition. Berzelius first noticed the fact that of the lime and magnesia contained in the food of animals the former is taken up by intestinal absorbents to a greater extent than the latter. Crystals of ammonio-phosphate of magnesia can, indeed, be frequently detected in perfectly healthy excreta: we are therefore not surprised to find that in certain abnormal conditions of system these crystals will be deposited in the intestines instead of being ejected.

Dr. EDWARDS remarked that these calculi were by no means rare, for they had in the Museum at Liverpool, two even larger than the present, one weighing about eleven, and the other thirteen pounds. He had not hitherto examined them, but should now do so, to ascertain if they confirmed the observations made by Mr. Attfield concerning the presence of lime and magnesia salts.

Mr. BOTTLE asked if silica had been looked for. Mill-horses being particu-

larly liable to depositions of calculi, veterinary surgeons had supposed that the dust off the millstones contributed to their formation.

Mr. Attfield said that the gentleman who sent the calculus had made similar remarks. Silica had therefore been specially looked for, but none found. He would not expect to find it in intestinal calculi. A calculus is generally composed of substances insoluble in the liquid in which it occurs. Millstone dust would probably be retained in the stomach or not be deposited at all, the contents of the intestinal canal becoming less acid as they approach the rectum in the neighbourhood of which they are alkaline. He believed that silica had been found in gastric calculi.

SUPPOSED POISONING FROM ARSENICAL PAPER-HANGINGS.

Mr. Maxwell stated that, at the request of a medical practitioner, he was induced to bring before the notice of the meeting a supposed fatal case of poisoning from green paper. The paper, a specimen of which he now exhibited, had been removed from the wall of a room, and with which it was hung. The room was constantly inhabited, and from the fact of a death having occurred in the family with previous symptoms of arsenical poisoning, the paper had been supposed to be the cause. The paper had been examined, and found to contain arsenic.

The Chairman, upon examining the paper, said that he did not believe there was much arsenic in it; he doubted whether such a paper could have produced death, unless a portion had been swallowed, of which there was no evidence in the present case. So far as his experience went, he believed that the injurious effects attributed to green paper-hangings had been exaggerated. He thought that flock papers might have a poisonous effect upon persons exposed to their influence; but that the varnished papers, unless eaten, could not do any harm.

A Member remarked, that if these green papers were so injurious, the makers of such papers and the paper-hangers ought more especially to suffer from arsenical poisoning; but such was not the case.

Mr. Haynes Walton also thought that the evil effects of such papers had been much over-estimated. He knew a case, in which a lady, living in Portland Place, had been attacked by illness, which was supposed to have been caused by the green paper with which one of the rooms was hung, and in which she was accustomed to remain for a length of time. The husband had the paper removed; and the lady getting better shortly afterwards, her recovery was at once attributed to its removal. Some time afterwards, however, she was attached by similar symptoms, which proved that the arsenical paper had nothing to do with her attacks.

Dr. Redwood said he should require very good evidence to convince him that in the present case the paper had anything to do with the death of the child. He also thought the effects of such papers had been exaggerated.

Mr. Bottle thought, that if the walls of rooms hung with such papers were very damp, the colouring matter might then be removed, and cause evil effects upon those inhabiting them. He believed, however, that the green ornaments worn by ladies, and in use for other purposes, which contained arsenic, were a much more fertile cause of poisoning than green paper-hangings.

Dr. Edwards remarked that cases had occurred within his experience which led him to the conviction that wherever arsenic acted as an irritant poison, it might be detected by chemical means, if the organs and excretions were properly examined. One case especially he remembered, which confirmed this opinion:—Five children were taken ill in Liverpool by eating arsenical

sweetmeats upon a Christmas-day; three children died and two recovered; and he had examined the excretion of urine in the surviving children, as well as the bodies of those who had died. In the latter case, although the dose was small, probably a minimum one (for the children lived nearly a week), the arsenic was readily detected in all the soft organs of the body, as well as in the tissue of the intestinal canal; the poison was not found however in the food contained in the stomach at death. This showed that the process of elimination was slow, even when the dose was small and death protracted. But the more striking fact was, that in the urine of the children who survived, arsenic was detected at periods of fourteen, twenty-one, and thirty days after the administration, and when examined six weeks afterwards the urine gave no trace, showing that it had then become eliminated from the body by the kidneys. In the face of such an instance as this he could give no credence to assertions of arsenical poisoning with fatal issue where that poison could not be detected in the body after death, or in the vomit, or in the excretions during life. He would not assert this in respect of all poisons, but especially in reference to arsenic, which, if absorbed in sufficient quantity to produce death, would, in his opinion, invariably be found after death in the tissues of the body.

PURIFICATION OF WOOD NAPHTHA AND METHYLATED SPIRIT.

Dr. Redwood submitted to the meeting a specimen of wood naphtha purified by Mr. Eschwege's process, to which attention had been directed in the 'Pharmaceutical Journal,' and made some observations on this purified naphtha and on the subject of methylated spirit. With reference to the latter subject, he said he did not propose to discuss it in all its bearings, nor even to touch upon some of the questions which have been recently raised, and have excited so much interest among pharmaceutists and others. He found that an opinion was entertained among some persons, to the effect that methylated spirit could, by processes recently discovered, be easily deprived of the wood naphtha it contained, and that the security supposed to have been afforded to the revenue by the use of naphtha in methylated spirit could no longer be depended upon. He believed this opinion was entirely erroneous, for in no instance that he was aware of had the separation of the naphtha from methylated spirit been effected, nor indeed had anything been done that was thought impracticable when methylated spirit was first introduced. For all practical purposes, methylated spirit had been found to realize what was contemplated in its introduction. It afforded to the excise authorities the means of allowing the use of duty-free spirit for manufacturing purposes, without the fear of such spirit being made available for use as an ordinary beverage. This was the object originally proposed, and he believed it was as successfully accomplished now as at any previous time. The introduction of methylated spirit had been a great boon to manufacturers in this country; the use of this spirit was from year to year being extended; and he did not find that the excise authorities, who were always sufficiently sensitive on such points, were more fearful now than formerly that the revenue would suffer beyond what was contemplated. It was intended by the Legislature that this duty-free spirit should be available for all purposes for which spirit was required, excepting for use as an ordinary beverage, and every practicable facility was afforded for such applications of it. The presence of the naphtha enabled the excise officers to prevent its being used as a beverage. But then it was said and appeared to be thought by some persons that the purification of methylated spirit was now so completely and easily effected, that in this state it might be flavoured and sold for drinking as an ordinary beverage, and

the revenue be thus defrauded. The process referred to for thus effecting its purification was one which had been recently patented by Mr. Eschwege. He had a copy of this patent in his hand, and had obtained from the Exhibition a sample of the so-called "Potable Naphtha," purified according to the patented process, which any one present could examine and taste. The process was not a new one; in its principal features it had been patented before, by Mr. Blumberg, in 1845. The process consisted in largely diluting the spirit with water, and then filtering it through charcoal. This process did not contemplate, nor was it capable of effecting, the separation of naphtha from alcohol; its object was to purify both naphtha and spirit from empyreumatic oils and other substances with which they may be contaminated. The great extent of the dilution, and the large quantity of charcoal required to effect the purification, would present obstacles to the adoption of this process to any considerable extent without the knowledge of the excise, and as the purification of methylated spirit was illegal, this would not of course be permitted. He could not agree with Mr. Draper that the so-called "Potable Naphtha" was undistinguishable from pure spirit of wine. The samples he had obtained reminded him of nothing but purified wood naphtha, to which they answered in all their characters. This naphtha was not more pure or free from flavour than samples he had previously seen and prepared; although of course it was much more pure than any that was commonly met with in commerce. When diluted with water, or allowed to evaporate on the hand or a piece of paper, the peculiar flavour of the naphtha was readily distinguished. He did not deny that Mr. Eschwege's process was a good one for purifying naphtha or spirit, but neither could he admit that the naphtha thus purified was more pure than any that had been otherwise prepared, nor did he think that the publication of this process was likely to interfere materially with the safe working of the law which provided for the supply of duty-free spirit for use in manufacturing operations.

Mr. Vizer wished, before the meeting separated, to call the attention of Members, and especially of the Council, to a circumstance which had already been noticed in the 'Lancet.' He alluded to the subject of a letter which appeared in that publication from Mr. Blades, complaining of the conduct of some Members of the Pharmacopœia Committee, who, availing themselves of the knowledge they acquired of processes to be introduced into the 'British Pharmacopœia,' were preparing and selling such preparations before the Pharmacopœia was published. He thought such conduct was highly improper, and that it ought to be immediately stopped.

Mr. Curtis and Mr. Urwick said they agreed with Mr. Vizer in thinking that conduct such as had been referred to ought to be noticed by the Council.

The Chairman said he was entirely ignorant of the matter referred to; but if any such evil existed, and it was brought in a proper form under the notice of the Council, it would no doubt receive their prompt attention.

PHARMACEUTICAL SOCIETY, EDINBURGH.

The First Meeting of the present Session was held in the Hall of the Royal Society of Arts, 117, George Street, on Thursday evening, 20th November, at nine o'clock. There was a full attendance; Mr. Aitken, President, in the Chair.

As usual, the President gave the following

OPENING ADDRESS.

Gentlemen,—In taking my place as President of the North British Branch of the Pharmaceutical Society of Great Britain, at the commencement of another Session, I

beg to thank you for the honour conferred, at our last Annual Meeting, in electing me to the high position I now occupy. I hope to be enabled to fulfil the duties of the office with satisfaction to you; and should I be successful in doing so, it will be a source of much gratification to myself. I trust, also, our meetings may be in the same spirit of unanimity and friendship which has characterized all our former assemblings, and that nothing will occur which shall detract from the pleasure we have always enjoyed at these scientific reunions.

We have had cause of congratulation on the successful results of our former sessions, and we look confidently for assistance from the gentlemen who have already read papers at those meetings, and some of whom have promised (if required), to renew the favour. It would be very satisfactory, however, were some of our own members to aid us in this way; and I am sure there is no want of talent amongst our Associates, so that I hope they will take this into consideration, and occasionally bring the subjects of their study before us.

I may be allowed here to congratulate the members on the success which attended our first Conversazione in the Industrial Museum. The company on that occasion exceeded four hundred ladies and gentlemen, who, without exception, expressed a high sense of pleasure in the arrangements for that evening—a pleasure which was certainly much enhanced by the kindness and attention of Professor Archer, and in the many interesting remarks and observations made by him on the various subjects which were brought under notice in that magnificent collection.

Since our Annual Meeting in April, we have been mainly indebted to the *Pharmaceutical Journal* for any information we possess as to the Parent Society; and I think we may all be well pleased with the progress and the success which it has hitherto attained—the great improvement it has been the means of making on pharmacy, and in raising the character and improving the attainments of Pharmaceutists—and likewise in the benefits which it has been the means of conferring upon its own members, the latest of which is the exemption of Pharmaceutical Chemists in England from serving on juries—an exemption which, it is to be hoped, will soon be extended to Scotland.

The new American remedies, in like manner, have been well and instructively brought before us by Professor Bentley in the same journal; and the materia medica, with the various pharmaceutical productions shown in the International Exhibition, has not been overlooked.

The progress of manufacturing chemistry has been well kept in view. We are assured that this science has never been better illustrated than in the Great Exhibition; and among so much excellence, and so many exhibitors of the highest standing, we are glad to find that our own city has been so well and ably represented by Messrs. J. F. Macfarlane and Co., in their admirable series of chemical substances, procured from organic sources—from opium chiefly, and from bark, galls, etc. The large basin-shaped mass of fine crystals of codeine, weighing nearly sixty ounces, exhibited by this Company, has been very much admired, as well as beautiful specimens of bebeerine, and an admirable collection of the salts of morphia in different conditions of purity, showing the various stages in the manufacture of this important drug. Messrs. Macfarlane's series has been characterized as having no superior of its kind in the chemical section, or anywhere else in the building.

Messrs. T. and H. Smith were equally successful in a display of a variety of specimens. Those especially deserving notice, where all were excellent, are aloeine, caffeine, narcotine, and cantharidine. The crystals of the various substances exhibited by Messrs. Smith were well defined, and the specimens were very liberal.

Messrs. Duncan, Flockhart, and Co. had some beautiful specimens of several chemical substances, in the manufacturing of which they enjoy a world-wide reputation—such as chloroform and chloric ether, prepared both from ordinary and methylated spirit; and Mr. John Mackay, our much-respected secretary, exhibited a case of those substances in which his house so much excels.

I regret that our expectations as to the National Pharmacopœia have not yet been realized—questions having arisen with reference to the weights and measures which have been the means of delaying the publication of this great work; now, however, that this weighty war of decimal and metrical systems has come to a termination, it is

to be hoped before the close of our session we shall be in the possession of this book, the want of which has so long been felt by the dispensing chemists and druggists in the United Kingdom.

While on this topic, I may inform you that a new Pharmacopœia has been proposed for all Germany. In the last sitting of the Germanic Diet, the President announced that the representative of Wurtemberg moved the Diet to take the necessary measures for the publication of a new Pharmacopœia, and of a uniform system of apothecaries' weights for all Germany, and concluded with proposing that a committee of professional men should be appointed by the different governments for the purpose. The motion was referred to the Politico-Commercial Committee for consideration.

In announcing that comfortable rooms have been secured for our museum and library, I take the opportunity of calling on all of you to do what you can by presenting books or specimens, or in any other way to show your appreciation of the benefits which you derive as members of this Society, and to raise the library and museum to that standard of excellence in numbers as well as quality which I trust is the wish of every member of this Association. Since we last met a few interesting specimens have been added to the museum, and a number of excellent works to the library; the whole has been carefully arranged and numbered by Mr. Hill, an Associate, who, under a Committee, has been appointed librarian and curator of the museum.

To the older members I would humbly suggest that they might spend an occasional half-hour very profitably in examining the museum and library. There may be in the remembrance of many of you a remark made by Dr., now Professor, Douglas Maclagan, in a lecture he kindly delivered to us, "that we ought to make every exertion in our power to extend our own knowledge, to cultivate our own science, and to improve our own art." It was also said on a similar occasion, by the late Professor George Wilson, "that as the Pharmaceutical Society is not an association of scientific or amateur students of pharmacy, but a union of those who pursue it as a profession, and who propose to make it their life-long vocation," we ought to embrace every opportunity of improving ourselves, and in assisting others, who, being differently situated, have not the same means for improvement that we possess. This cannot, I humbly think, be accomplished more easily and better than in now and again taking advantage of those opportunities which the library and museum bring almost to our doors, for studying both the older and more recent publications bearing on those subjects more intimately connected with our profession, but also in making some provision that those members at a distance may, under certain regulations and restrictions, have the same use of the library that their brethren in this place enjoy.

I would more especially call upon the younger members—the Associates and the apprentices—to take advantage of the means of acquiring knowledge thus placed within their reach. They will find in the museum much worthy of their study, and in the library an assortment of books upon various subjects well fitted to instruct and enlighten. I would earnestly impress upon them that though the acquisition of knowledge is one of the most pleasing employments of the mind in every period of life, it is, in youth especially, there are circumstances which make it productive of higher enjoyment. It is then that everything has the charm of novelty, that curiosity and fancy are awake, and the heart swells with the anticipations of future utility and eminence.

Even in acquiring those branches of instruction which we call mere accomplishments, there is something always pleasing. But in the acquisition of knowledge of the higher kind, when the young, as it were, gradually begin the study of the laws of nature and of the faculties of the human mind, there is a pleasure of a sublimer kind. The world opens with all its wonders upon their eye; their powers of attention and observation seem to expand with the scene before them, and, while they see for the first time the immensity of the universe, and mark the majestic simplicity of those laws by which its operations are conducted and governed, they feel as if they were awakened to a higher sense of being, and are admitted into nearer intercourse with the Author of Nature—called upon to look from nature up to Nature's God; while the pursuit of knowledge leads not only to happiness, but to honour. "Length of days are in her right hand, and in her left are riches and honour." If then it is honourable to make exertion even in the most trivial species of knowledge, even in those

which can amuse only the passing hour, it is certainly more honourable to do so in those different branches of science which are connected with the liberal professions of life, and which tend so much to the dignity and wellbeing of human nature.

It is the means of raising the most obscure to esteem and respect, it opens to the just ambition of youth some of the most distinguished and respected situations in society, and it places them there with the consoling reflection that it is solely to their own industry and labour, under the Providence of God, that they owe them. But to excel in the higher attainments of knowledge, to be distinguished in those greater pursuits which have commanded the attention and exhausted the abilities of the wise in every age, is perhaps of all the distinctions of human understanding the most honourable and grateful.

Every science is the foundation of some art beneficial to man, and while the study of it leads us to see the wisdom and the beneficence of the Creator, it calls upon us also to follow his great end in their employment and application.

I need not then say what a field knowledge opens to benevolence. I need not tell you that in every department of learning there is good to be done to mankind. I am sure I need not remind you that the age in which we live has given us the noblest examples of this kind, and that science now finds its highest glory in improving the condition or in alleviating the miseries of humanity.

It is not however for one moment to be supposed that every man can be great, but it is certainly in every one's power at all events to be distinguished; and it may happen that, in the prosecution of our studies or in our scientific researches, the foundation of a something never dreamt of may be laid, which will cause our name to be remembered hereafter with the greatest honour and respect. How little did he who first combined an atom of hydrogen with two of carbon and three of chlorine dream that thus was revealed to mankind the beneficent elixir which would cause that dread and ancient travail of the woman to cease; which would convert the despairing moan and the agonizing terror of the operating table into a calm and dreamless slumber, and which shall confer an undying fame on Dumas and on Simpson.

He, then, who in the study of science has discovered a new means of alleviating pain or of remedying disease, who has descried a wiser method of preventing poverty or of shielding misfortune, who has suggested additional means of increasing or improving the beneficial productions of nature, has left a memorial of himself which can never be forgotten, and which will communicate happiness to future generations.

At the close of these remarks, Dr. Seller, F.R.C.P.E., read the following Address :—

ON THE RANGE OF PHARMACOLOGY.

BY WILLIAM SELLER, M.D., F.R.S.E., FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

When the Council of the Pharmaceutical Society did me the honour to invite me to open this session with an address, I felt the compliment too great to permit me to decline their request. Yet not till I had undertaken the task, did I realize the difficulty of finding topics suitable for the occasion. Fortunately for me, the events of the last few years have rendered the present era a prolonged crisis as well in pharmacology as in medicine. The old landmarks have been swept away; a new page in the history of almost every department connected with medicine has been opened up; and among the members of the pharmaceutical profession, aroused by the occurrence of so many novelties, there is still room for the question—what is our altered position?

It has struck me that I might profitably employ this opportunity by contributing some considerations tending towards an answer to that question.

Pharmacy, as a vocation, stands in the position of a scientific pursuit. The education hereafter to be imposed on those who practise it, entitles them to rank with the learned professions. There is still an art to be followed out; but the study of the several sciences on which that art is dependent, is now urged imperatively on their attention. It must be acknowledged that the cultivation among pharmaceutists of the sciences on which pharmacology rests, though many times carried to a great extent, has been too much, with the majority, the exception rather than the rule; but

under the new era which has arisen, the expectation may be entertained that what has been hitherto the exception will become the rule.

In the meantime, the leading point for congratulation is the success of all the late measures, both in the pharmaceutical profession and in the medical profession, towards the great and important object of promoting, throughout the empire, the separation of dispensing medicines from the treatment of diseases. An example of this separation has long been set in this city; but much yet remains to be done to render the change universal, and no little circumspection is still required, among all concerned, to make the late measures effective for the progressive advancement of this reform.

While, then, a more decided line of demarcation begins to be drawn between pharmacy as a profession and the practice of medicine, it is a proper occasion to consider both what pharmacy has contributed in past times to the common store of knowledge subservient to medicine and what it may be expected hereafter to contribute to acquisitions of the same description.

There can be no doubt that natural history, and chemistry in particular, during the last several centuries have owed much of their advancement to pharmaceutists. More than enough of honour in this respect is ascribed to the alchemists, who devoted themselves to the search after the philosopher's stone and the universal medicine. But since the time, at least, when chemicals came to be of current use in the practice of medicine, the pharmaceutical profession has largely distinguished itself in both these departments.

In ancient times there were many names seemingly applicable to the profession of pharmacy,—*seplasiarii*, *pharmacopolæ*, *medicamentarii*,—yet no evidence exists as to the extent to which the persons so designated discovered or prepared medicines. One thing is certain, that travelling herbalists brought to the principal seats of literature and science such plants as had gained the repute of being medicinal in the countries which they visited. In this manner the vegetable materia medica gained its earliest important accessions. With most medicines, at their first introduction, some mythological legend was connected. Indeed the knowledge of the medicinal virtues of plants and natural bodies in general, like that of all the higher branches of knowledge, was referred by the Greeks and Romans to the heroic ages, and to the agency of presiding deities. Even in the Augustan age, Virgil exacts from his readers the belief that Iapis, who came to the aid of Æneas when wounded by Turnus, had been instructed by Apollo in all the arts over which that god presided, while Iapis preferred—

> "Scire potestates herbarum usumque medendi
> . . . . et mutas agitare inglorius artes."

But as the herbs used by Iapis failed to loosen the arrow by which Æneas was wounded, Venus herself comes in disguise from Crete with the *Dictamnus* (afterwards known among chemists for its inflammable atmosphere), which had immediately the desired effect. Such legends, however, plainly owed their perpetuation in later ages to the faith with which they inspired the patient in the efficacy of the remedy. Melampus, who belongs to the heroic era, knew the tonic efficacy of rust of iron; yet he sends his patient to seek a rusty sword which an eagle had pointed out after it had long lain in the hollow of a tree, with the scrapings of which the patient was to be cured.

Notwithstanding such frivolities, we owe to the ancient world not a few still highly-esteemed articles of the materia medica. On this point, give me leave to take a slight retrospect. As respects vegetable medicines in particular, the articles in use at present are either:—first, from plants known to the ancients, that is to the Greeks and Romans, prior to the fall of the Western Empire, five or six hundred years after the birth of Christ, the latter part of this era being marked by the writings of Ætius, Alexander Trallianus, and Paulus Ægineta; secondly, medicines made known by the Arabian physicians and pharmacologists in the period between the Mahometan Hegira, in the seventh century of the Christian era, and the time of the Crusades, the earlier period being distinguished by the writings of Aaron, Mesue, and Serapion, and the latter period by those of Avenzoar, Averrhoes, and Albueasis; thirdly, medicines introduced by European physicians and pharmacologists in their own several countries

and spread over the rest of Europe after the revival of letters, marked by the fall of Constantinople and the invention of printing, down to the present time; fourthly, medicines introduced into Europe by European travellers or settlers in America and the Eastern world, to which may be added the medicines which are now poured upon us with so lavish a hand from the medical practice of the transatlantic physicians and pharmacologists of the United States of North America.

When we compare the numbers of important medicines standing in these several lists, we find that the list containing those known to the ancients and that containing those introduced from distant parts into Europe, each far exceeds the list containing those introduced by the Arabians, as well as the list containing those discovered at home, since the revival of letters, by European physicians and pharmacologists.

In the list of plants known to the ancients stand aloes, scammony, colocynth, squill, asarum, myrrh, sagapenum (perhaps also galbanum and assafœtida), rue, madder, savine, and saffron; to these may be added cane-sugar, for it was not ignorance of the sugar-cane, but of a suitable method of extracting sugar from it, that rendered cane-sugar scarce among the Greeks and Romans.

Among the medicines introduced from the vegetable kingdom by the Arabian pharmacologists are camphor, ammoniacum, cassia, tamarinds, manna, rhubarb, croton seeds, clove, nux vomica.

Among the plants indigenous to Europe added to the materia medica since the revival of letters, and still retained, are valerian, foxglove, belladonna, stramonium, dulcamara. Among those drawn from distant countries during the same period are cinchona, quassia, calumba, jalap, gamboge, senna, ipecacuanha, kino, catechu, logwood, balsam of Peru, balsam of Tolu, copaiba, cherry laurel, guaiacum, sarsaparilla, senega, buchu. Of the most recent importations from America, the *Actæa racemosa* or *Cimicifuga racemosa*, *Podophyllum peltatum*, and the *Veratrum viride*, are examples.

I should ask your pardon for occupying your time with matters so commonplace as lists of medicinal plants. Nevertheless, I have still one other statement of the same kind to make, namely, that in the last edition of the 'Edinburgh Pharmacopœia' the number of medicinal plants amounts to about 170. In the forthcoming 'Imperial Pharmacopœia' the number, I think, will be somewhat diminished. But the point to which I wish to draw your attention is the question, whether such a number of vegetable medicines as that now in the Pharmacopœias constitutes the whole amount of the vegetable kingdom to which pharmacology is applicable.

It is undeniable that mere fashion, in no small degree, governs the reputation of the medicines in general use at any particular epoch. But pharmacology as a science must be universal. It should embrace all the plants which have any pretensions to medicinal virtues. And the same thing is true as respects the two other kingdoms of nature.

This may seem at first consideration a useless and unwarrantable extension of the limits of pharmacology. But where is the line to be fixed? The lovers of new medicines will be greatly disappointed if they expect to find many of their chief favourites in the catalogue of materia medica in the long-expected 'Imperial Pharmacopœia.' They will therefore willingly reject such a criterion of the merit of a remedy. It may be said, on the other hand, that there is a multitude of plants, possessed, indeed, of some medical virtues, but which nevertheless are so manifestly inert as to merit perpetual oblivion. But the past history of Pharmacology decides against this view. It shows, beyond doubt, that substances reputed by the physicians of one age to be examples of the very essence of inertness have nevertheless come to be acknowledged as potent remedies, and that articles thrown out in one edition as encumbering the pages of the Pharmacopœia, have been received in the next edition as medicines of unquestionable efficacy.

In the early part of this century burnt sponge, *Spongia usta*, was a standing joke among the *petits-maîtres* of medical practice as a substance laughable for its absolute inertness. Its original reputation was in goitre and scrofula. I remember having heard a very eminent lecturer denounce it in such diseases with every epithet of scorn which he could heap together, representing those who could put faith in such a substance as fit associates for superannuated old women; and all this scorn was at the very time when Coindet, at Geneva, was engaged in proving iodine, which burnt

sponge contains, to be the remedy of remedies in those very diseases in which burnt sponge acquired its reputation. It is even alleged on high authority that the contempt in which burnt sponge was held in the lecture-room often extended to the laboratory, and that, when prescribed, it was seldom sent out by dispensers, a little disguised charcoal of wood being put in its stead. If this be true, it was a breach of faith which cannot be too much condemned.

What has been said of burnt sponge might have been said with the same truth of the *Æthiops vegetabilis* obtained from the *Fucus vesiculosus*, the sea-weed which has so recently started into fame with new-found virtues. In short, burnt sponge and the *Æthiops vegetabilis* were the first available forms in which the powerful effects of iodine could be obtained.

The history of Foxglove affords a striking proof, of a different kind, of the necessity of looking beyond the lists of medicines in vogue for the day if we would exhaust all the importance of Pharmacology. It seems impossible that so attractive a plant as Foxglove should have escaped the attention of the ancients. Nevertheless it did either escape their attention, or the names by which it was known to them have entirely failed to be identified in modern times. The name Foxglove can be traced in the Saxon tongue to about the time of the Norman conquest; but it hardly appears in medical writings till the sixteenth century. Fuchs, who then noticed it, has been rewarded in recent times by the perpetuation of his name in the magnificent genus Fuchsia. Parkinson, one of the earliest of eminent English botanists, who was royal apothecary in the reigns of James I. and Charles I., speaks of Foxglove as being employed in the form of decoction in epilepsy, and of its external application in goitres. Ray, fifty or sixty years later, mentions its employment in scrofula; and its external use appears to have been known about the same time in Germany and Italy. In the earlier editions of both the London and the Edinburgh Pharmacopœia, it was admitted, but near the middle of last century it was thrown out of both. Only a few years ago, many were alive who remembered the time when Dr. Withering first established its reputation on a solid basis. If, no more than seventy or eighty years ago, when medicine was cultivated with the utmost zeal, the properties of such a plant as Foxglove were still doubted of, how many more plants, at present looked on with contempt for their supposed inertness, may be found to have incorporated in them virtues of a parallel character?

Let me cite another example of a plant possessed of properties of the most peculiar description, which in modern times, till within the memory of the present generation, was regarded as a mere irritant diuretic of no medicinal importance; I refer to colchicum. We seem to owe the discovery of its remarkable power to an old French soldier, Monsieur Husson, who lived for many years on the produce of his discovery. It may be that Monsieur Husson was only fortunate in discovering the identity of colchicum with the hermodactylus of the ancients; a belief now entertained by many. If this be the case, we shall have here an example of a plant of great repute having lost its character by a change of name.

That hermodactylus and colchicum were known to be identical down to a comparatively recent period, I have found what I consider an unequivocal proof in a singular little book, printed at Aberdeen in the year 1625. It is entitled "Pharmaco-Pinax (that is, drug-index), or a Table and Taxe of the Pryces of all usuall Medicaments, Simple and Composed, contayned in D. Gordon's Apothecarie and Chymicall Shop, within Mr. Robert Farqvhar's high Lodging in New Aberdeen." What I regard as the proof referred to, is that in the list of simples under "hermodactylorum," described as of "whyte round roots," are given the Scotch and English synonyms of colchicum —namely, dog's-bane and mead-saffron.

To resume, the secret of Monsieur Husson's remedy might not have been discovered so soon, but for the important modern clue to the discovery of plants of medicinal virtue, furnished by the presence in them of peculiar alkaline or neutral organic principles.

The alliance of the alkaloid veratria to colchicia led to the final discovery of Husson's secret; but veratria suggests another illustration of what I am urging, in the case of *Veratrum viride*, at present in high fashion with the lovers of new medicines. If this plant be found to possess the peculiar virtues ascribed to it by its

partisans, it will forcibly prove the necessity of examining the physiological properties of plants lying before us with the reputation of being useless, before we can say that the task imposed on pharmacology is complete. This plant, the *Veratrum viride*, has been known, even in this country, for considerably more than a century; yet nothing was observed of it beyond its possession of the qualities common to the species of the genus Veratrum; nor yet in America, its native country, where it is so well known as to have a dozen of popular names, was anything further discovered of its medical virtues so lately as the time when Dunglison's dictionary was published in 1853, since all his remark on it is, that its properties are like those of the genus.

These facts then, I think, sufficiently support the proposition which I have been urging on your attention, namely, that the present repute of a substance, in respect to its being inert as to medicinal effect, is no evidence against its being possessed of medicinal properties of the highest value; and hence, that the real field of pharmacology is coextensive, in the first instance, with the vegetable kingdom.

Further, the same observations apply to the two other kingdoms of nature. It is no answer to this conclusion to say that by giving to pharmacology so great a field, all investigation must be destroyed. By no means; it follows only that when new investigations are undertaken they must be pursued on a methodical principle. Subjects must be taken up, not indiscriminately, but in the order of their importance and promise. Things forgotten respecting medicines in less frequent use are to be recovered. Most of our treatises on medicines are in the form of dictionaries; each new compiler drops out, under every head, what he thinks of less interest to his own day, and thus many old authentic statements come to be forgotten.

The pharmacologist is now relieved from part of the task imposed upon him in former times. He finds the natural history of medicines for the most part accomplished to his hand. The division of labour has raised up an order of men, who are naturalists, and particularly botanists, by profession. The pharmacologist, who was once chief among botanists, must be content to forego that character. No one can be a botanist now, in the highest sense of that name, who does not devote his whole energies to the subject. The natural system of botanical arrangement is in all respects a great monument of human genius. It absorbs into itself all the knowledge of vegetable structure which the age possesses, and must improve, change, and advance in proportion as that knowledge increases. This natural plan is the height of methodical arrangement in both the organic kingdoms of nature. But their continual changes, necessary as these are to keep pace with the advancement of science, unfit them for the practical uses of such a branch of knowledge as pharmacology.

What I am going to say will probably surprise some of my audience, namely, that I cannot help regarding the Linnæan arrangement as better adapted for practical people than the natural system. The Linnæan arrangement can be learned with the utmost ease, within a very short time, with a very slender acquaintance with vegetable structure. Once learned, it undergoes no changes. If a person leaves off his botany for ten years, engaged in other pursuits, he returns to find the Linnæan arrangement the same as before. If he had studied the natural system, he would have found so many changes in that period as to discourage him from resuming his old pursuit. True, a complete knowledge of the natural arrangement makes a man for the time a perfect botanist, which is the same thing as to say that if one has not leisure to make oneself a complete botanist, that person cannot become perfectly acquainted with the natural arrangement. It is confessed the Linnæan system is but a catalogue, but that is exactly what a practical man wants. He desires to know if the plant in his hand has been yet described, if it has yet been named; the Linnæan system enables him to gain the information he requires, while as to the study of individual plants, that he can do by the Linnæan arrangement as perfectly as by the natural system. Moreover, a practical botanist is merely one who is acquainted familiarly with a number of plants.

But in whatever department of nature the medicine to be investigated lies, chemistry is still the chief instrument of the pharmacologist. It is here that he must always feel himself most at home. Little more than a hundred years ago, nearly the whole science of chemistry lay within the limits of pharmacy. The chemistry taught in the schools was pharmaceutic chemistry. The men of science who had penetration enough to descry the rising empire of chemistry over the secrets of nature, had to seek their

instruction in the operations of the pharmaceutical laboratory. To the high honour of having laid an ample foundation for the future science in an exact knowledge of the acids, metals, and salts in general, pharmacy has an indisputable claim. With the commencement of gaseous chemistry the science passed from under the immediate wing of pharmacy; yet since that time the labourers in the same field have made large contributions to the general extension of the science. The chemistry which is hereafter to belong to pharmacology must keep a more sequestered path than the general science, which already soars from the humble analysis of earth, air, and water, to wrest from Nature the secret of the constitution of the sun and moon and stars.

But there is enough left behind. Even the saline chemistry is not yet exhausted so long as the effects of so many metals remain untried on the human frame, and their compounds unexamined.

But the department of chemistry which most unequivocally points itself out as worthy to engage the attention of pharmacologists is that which, by showing the existence of organic principles, alkaline or neutral, in numerous species of the vegetable kingdom, serves as a clue to the discovery of their medical properties. Hardly a generation has passed away since Dr. Duncan, junior, of the University of Edinburgh, by showing the presence of a salifiable organic constituent in Peruvian Bark, laid the foundation of that wide domain of pharmacological chemistry. In this line much has already been done, more remains to be done. Beyond doubt many members of this order of medicines are destined to fill hereafter the place occupied at present by the most common articles. Morphia and Quinia are not to remain the only substances of this description, the annual consumption of which is reckoned by tons. For Morphia no substitute needs to be sought: its equal will not be found; and the poppy, which affords it, can always be cultivated to any required extent. It is far otherwise with Quinia; it is too likely that ere long substitutes must be sought for this alkaloid. The governments of the Cinchona districts of South America seem wholly insensible to the inevitable destruction, in no long time, of the trees yielding Cinchona, at the rate at which consumption is proceeding at present. Like the dog in the manger of old, they will neither themselves take steps to supply the growing deficiency, nor permit others who are willing to obtain the means necessary for that purpose. The recent stratagems and adventures of Mr. Markham in his attempt to obtain Cinchona plants and seeds in the virgin forests on the eastern slopes of the Andes, remind us of the story of the patriotic pilgrim, who, in the reign of Edward III., on the shores of the Levant, at the risk of his life, concealed a saffron plant in the hollow head of his staff, and so brought it safe to Saffron-Walden, in Essex. Let us hope that the small remnant of Mr. Markham's pilferings, so nearly lost by the ill-judged parsimony of our Indian Government, may be as productive in the Neilgherry Hills, Darjeeling, and Ceylon, to which places they have been distributed, as the pilgrim's single saffron plant proved at Saffron-Walden.*

For a time organic chemistry seemed to lie in a hopeless state of confusion, but of late it has made vast strides towards a more systematic and intelligible condition. Nor can it be doubted that the new doctrine of substitutions is destined soon to vindicate to itself all the simplicity so generally found ultimately to prevail in the operations of nature. Be this as it may in respect to the whole of organic chemistry, it is no longer dubious that all the varying circumstances under which the peculiar alkaline and neutral organic principles of plants have been found to exist, present a methodic plan of the most encouraging description. This methodic character extends to their composition, and to the modes of separating them from the substances with which they are associated, and the latter present so much the nature of a general formula that it cannot be doubted that many still undiscovered alkaloids and neutral principles are destined to be brought to light by simple modifications of that formula.

If it were required to propose exercises in practical chemistry, such as would best prepare one for the practice of the nicer operations in pharmacy, none could be suggested superior to those derived from manipulations with the organic alkalics and neutral principles. This may be too costly an employment to be practised often.

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* Some thousands of Cinchona plants have been raised from seed, and are now flourishing in India.—Ed. Ph. Journ.

Nevertheless if the alkaloids are to come into more general use, this kind of acquirement will be not merely a source of skill in practical operations or a guide to discovery in progressive chemistry, but a neeessary safeguard against imposition in the wholesale purchase of such medieines. Nothing is of more importance than the purity of drugs. In proportion as the pharmaeeutic ehemist becomes more and more a man of seienee, the publie will expect a greater vigilance on his part against deterioration.

How many substances, simple and eompound, remain yet to be discovered, it is hardly possible to estimate. There are, doubtless, many still to be brought to light whieh have never yet been found either in nature or in the laboratory. Again, there must be many that have been produced in the laboratory which have not yet been isolated, so as to exhibit their characteristic properties. Every simple smell belongs to a distinet body. Yet how many smells are familiar to the chemist which cannot be referred to any known substance. Had this axiom been followed up in the early periods of chemistry, many bodies, particularly gaseous bodies, would have been isolated ages before they were actually discovered. The smell of chlorine was familiar in the laboratory at a very early age, being produeed every time nitrie and muriatie acids were mixed to form *aqua regia*. The peculiar smell of hydrogen, when evolved by adding iron filings to dilute sulphurie acid, was well known in remote times. Dr. Black tells us, that long before hydrogen became known to ehemists, they were accustomed, when they had occasion to dissolve iron filings in dilute sulphuric acid, "to amuse themselves by firing this vapour, to make it give explosions or burn in different ways."

It were, however, needless to waste time in conjecturing how many new substances are to be found out hereafter, when there are so many known bodies still unexplored.

But I must not trespass longer on your attention.

One purpose of the preeeding observations has been to show that pharmacology possesses an inexhaustible field; that its objects are unfulfilled so long as there is any substance, natural or artificial, simple or compound, derived from the mineral, the vegetable, or the animal kingdom, not proved to be inert with respect to the living body, the properties of whieh have not been fully ascertained. Pharmaeology does not, indeed, profess to give a full knowledge of the physiological action and therapeutie effeets of the substances which fall within its pale. Yet, to possess a physiological action or a therapeutic effect, is the head-mark by which a substance is known to belong to pharmacology. Thus pharmacology eannot dispense with the general observation at least of physiologieal action and therapeutie effects, no more than therapeutics can dispense with a general acquaintance with pharmacology proper. Thus each subjeet runs inseparably into the other. It belongs to the physiologist, the pathologist, and the praetical physician, to study the nicer operations of medicinal agents, while it is the duty of the pharmacologist to make himself master of their natural properties, and in particular of their ehemieal relations; yet without a knowledge of the uses to whieh eaeh is to be applied, he cannot make his skill available to giving to each its proper form. That knowledge, however, he is entitled to expect, in ordinary eases, from the physician. Nevertheless, in taking new substanees into their eommon domain, the efforts of both must concur.

Thus, while we strive with good reason, and for the most desirable ends, to separate pharmaceutieal practiee from medical praetice, whenever the advancement of knowledge comes to be the objeet, pharmaeology and medicine coalesee at innumerable points, and must proeeed in their progress hand in hand.

Mr. D. R. Brown, in a few complimentary remarks, proposed a vote of thanks to Dr. Seller for his able, valuable, and interesting Paper. This was seconded by Dr. S. Macadam, and carried with hearty applause.

The Committee on Prize Essays reported, that only one Paper had been lodged with the Secretary. This Essay was "On the Decompositions which occur in the Preparation of the Acids of the Pharmacopœia." While the writer shows considerable acquaintance with the processes, formulæ, etc., connected with his subject, the Committee cannot commend it as showing any trace of original thought or inquiry, and therefore think that while not worthy of the President's Prize, yet the author deserves recognition, and re-

commend the presentation of a volume to him as a reward for his trouble, and in the hope that it may stimulate him to further exertion. The sealed envelope, on being opened, contained the name of John Thomas Holmes, Associate, residing with W. Botham, member of the Society, Old Haymarket, Sheffield.

Presentations to the Library from Dr. Macleod, Kilmarnock, Mr. Taylor Smith, Kilmarnock, and the President, were laid on the table; and also contributions to the Museum, from Mr. R. G. Stewart, Mr. Taylor Smith, and Messrs. Gardner and Ainslie.

The Secretary intimated the new arrangements for the winter, in reference to the Library, for the purpose of receiving back and giving out books. As increased facilities would be given during the winter, the Council hoped advantage would be taken by members, Associates, and pupils, of the privilege now offered.

Essays and competition for the President's and Register Fund Prize will be received by the Secretary till 1st March, 1863. Associates and apprentices resident in England as well as in Scotland, are at liberty to compete for the above Prizes.

The meeting thereafter adjourned.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

PRESIDENT'S ADDRESS.

Gentlemen,—Another year has been added to the existence of the Liverpool Chemists' Association, and in the ordinary routine of its duties, the Council has again appointed from amongst its members the various officers for the ensuing year. In the few introductory observations which I have to make, I shall not occupy your time with anything in the form of a history of the Society, but I may perhaps be excused if I make a passing allusion to some of those gentlemen who have held office, and to whom many thanks are due for its present efficient state. It is no very difficult matter, gentlemen, to set a society a-going, but the difficulty often consists in keeping it afloat. The enthusiasm and determination which often characterize men in the early history of any movement, and which enables them to overcome apparently insurmountable obstacles, can scarcely be expected to continue for any length of time; consequently its uninterrupted existence and prosperity must depend perhaps upon one or two circumstances, the excellency of the object sought to be carried out, and the pleasure and satisfaction to the persons immediately concerned in its management; and amongst the active and energetic minds who have from time to time been connected with this Association, I may perhaps be allowed to mention, without being open to the charge of invidiousness, the names of some of those gentlemen who have kept the machine moving in its onward course. When I look back to the establishment of the Society, I find that one of our profession was made its first President, namely, Robert Clay, Esq., a gentleman well known and highly esteemed in this town, and by whose influence, along with his colleagues in office, it was formed and taken charge of. Since that time, now thirteen years ago, the various offices have been occupied by a number of individuals, all interested in its progress, and I feel quite sure that you will endorse my remarks, when I say that to some four or five gentlemen are we especially indebted for the interest they have always felt in, and the time they have devoted to it. If we only take a very superficial glance at the Transactions published annually, we shall find that not only in their attendance at the public meetings, but in the contribution of subjects for the same, the names of Messrs. Abraham, Edwards, Evans, and Mercer, stand out prominently, and merit the warmest acknowledgments of all those who have the welfare of our Society at heart. To Mr. Walker also the best thanks of the Association are especially due, for the interest he has taken in the Library, and the large amount of time he must necessarily have devoted to it; and your Council have placed on

record in their minute-book, as well as in the Report read to you last week, their high sense of the value of Mr. Walker's services, and the fervent hope that his health may soon be fully re-established: and I may here remark that the future arrangements in reference to the Library will receive early attention.

I need not inform you that your Council have done me the honour of electing me your President for the coming year. This honour, I can assure you, I have accepted with much diffidence, being very sensible of my utter inability to fill the chair with anything like the same satisfaction to the Society which has characterized all my predecessors, and this remark applies especially to the gentleman who has recently vacated this honourable post, and which he has occupied during the past three years, with credit to himself and great advantage to the Society; and from this circumstance I feel assured that you will not wonder at my hesitation in succeeding to the office. However, with your kind indulgence, and the cordial co-operation of your Council, I shall endeavour, to the best of my ability, to discharge the duties appertaining thereto.

The object of the establishment of the Chemists' Association, I think I may designate as being of a twofold character, namely, protectional and educational; and in reference to the first, I think you will fully agree with me, that in very many instances have we felt the desirability and value of union. I need only remind you of the Poisons Bill attempted to be imposed upon us, whereby our movements in business would have been seriously interfered with, but which, by united and prompt action, was averted; and I may also mention another matter which would especially have affected the chemists of Liverpool, I mean the attempt by the Government to carry the entire medicine-chest trade for emigrant ships to the Apothecaries' Hall in London; this, as most of you are aware, was energetically and successfully resisted by this Association, in the persons of several members who still belong to us, and some of whom I have the pleasure of seeing here this night: and in addition to the above, I might enumerate the Stamp Duties, and other Excise annoyances with our trade. But I look upon the second part of our constitution as of far more importance (important though protection may be), that is education. An impetus in this direction was given twenty years ago by the establishment of the Pharmaceutical Society; and, in approval and imitation of this, sooner or later, several local societies sprang up in various parts of the country, of which this Association may be considered as one: and when I look round and examine the past history of some of these local efforts, I cannot but heartily congratulate the chemists and druggists of Liverpool on the liberal manner in which they have supported the endeavour to assist the rising generation of our trade. It is evidence, I think, conclusive, that they rightly appreciate the great value of a thorough practical education in raising the position of the dispensing chemist to that degree to which the importance of his profession entitles him; and I trust that the members of this society are fully satisfied that those who have from year to year taken the management, have succeeded in providing efficient educational appliances for the attainment of that object.

The student in Liverpool has now facilities for acquiring a knowledge of his business, quite equal to that of London, and superior to that of any other provincial town. We have now scientific meetings, lectures on Chemistry and Practical Pharmacy, with the use of an excellent museum and library belonging to this Society. The library, I believe, contains a larger collection of books on subjects pertaining to our profession, than is to be found in any out of London; and this and the museum are open daily to the Members and Associates, and the continued extensive use of the former is at once evidence of the value attached to it. In addition to the above, lectures on Botany and Materia Medica are available. You are also aware there is a Botanic Garden in a most efficient state, the plants named and classified according to their natural orders, and accessible free daily from an early hour in the morning; and while on the subject of education, I would take leave to offer a few words of advice to my younger friends, Members and Associates of this Society, and especially to those who are in their apprenticeship.

It is an old and truly valuable maxim, because often proved correct, "He becometh poor that dealeth with a slack hand, but the hand of the diligent maketh rich."

Now I should like to impress upon you the desirability, if not the absolute necessity, for diligence *in early life*, if you are at all wishful to keep pace with the progress of knowledge, for at this period the faculties are developing themselves, and are waiting to expand and burst forth into full power, and in proportion to the diligence and care with which they are cultivated and rightly employed, will be the success which will characterize your future, and the position you will attain in after life; and you may depend upon this, that early life misspent or unimproved, can never be made up; for the cares and anxieties incident to the advance of life will take possession of your minds, to the comparative exclusion of all mental efforts at improvement.

We are not without instances of some, whose success in early life has been most extraordinary.

It is recorded by an eminent writer that Sir Isaac Newton, extensive as his acquirements were, had either practically completed, or at least theoretically created, the whole of his great discoveries, before he reached the age of twenty-five, and, although he lived to an advanced age, may be said to have consummated his worldly greatness at forty-five.

Here is another instance, and this in a path which many of you have already entered; I mean the study of Botany. When Sir Joseph Banks was at Eton School, and in the fourteenth year of his age, his tutors complained of his extreme aversion to study, and inordinate love of active sports; but on one occasion he was found reading at the hours of play, and the change which had been effected in his habits was described by him to Sir Everard Home as arising from an accidental circumstance. One day he had been bathing with his fellow-Etonians, and on coming out of the water to dress, he found that all but himself had gone away. Having put on his clothes, he walked slowly along a green lane. It was a fine summer evening, flowers covered the path, he felt delighted with the natural beauties around him, and exclaimed, "How beautiful! Would it not be far more reasonable to make me learn the nature of these plants, than the Greek and Latin I am confined to?" His next reflection was, that he must do his duty, obey his father's commands, and reconcile himself to the learning of the school. But this did not hinder him from immediately applying himself to the study of Botany, and, having no better instructor, he paid some women who were employed in gathering plants—what is called culling simples for the druggists—for such information as they could give him, the price he gave being sixpence for each thing they told him.

Returning home for the holidays, he was inexpressibly delighted to find on his mother's dressing-table an old torn copy of Gerard's 'Herbal,' having the names and figures of those plants with which he had formed an imperfect acquaintance, and he carried it with him back to school.

Now you may perhaps in reply say, that this was rather an expensive way of gathering knowledge, sixpence for each isolated fact, but it showed clearly that he was intent upon acquiring a knowledge of botanical science; and there is no doubt that it was this determination, combined with diligence, which enabled him to take his position as one of the first botanists of the day. It is true he may have been favoured with some facilities and means which may not fall to the lot of any here present; but at the same time, if you take care to make the best of all your opportunities in proportion to what he did, you will have no cause to regret the time which you may have devoted to this branch of your education; but diligence is essentially necessary, and as has been observed by a writer, "The battle of life, in by far the greater number of cases, must necessarily be fought uphill, and to win it without a struggle, is perhaps to win it without honour. If there were no difficulties, there would be no success; if there were nothing to struggle for, there would be nothing to be achieved. Difficulties may intimidate the weak, but they act only as a stimulus to a man of resolution." And supposing you may not be able to achieve all that you desire, still you will be accumulating such an amount of information as is sure to turn out to your advantage, sooner or later. There is one suggestion I have to make, and that is, let nothing be done carelessly, for you are no doubt aware, that some of our most valuable discoveries have been made indirectly, that is, in researches for the discovery of other substances. This was the case with the Alchemists of old, who, in their eager pursuit of that *ignis fatuus*, the transmutation of the baser metals into gold, contributed very much towards the chemistry of their day. It was in this manner that the celebrated chemist

Black, while engaged in making experiments with the alkaline earths in order to find out a solvent for the "stone," discovered that the causticity of lime was due to the expulsion of fixed air, or carbonic acid, a discovery which has been of incalculable benefit to this country. Also, in reference to another substance, it is stated that Cavendish, while experimenting on the combination of hydrogen with common air, observed that the water resulting therefrom was slightly tinged with acid, though not always when pure oxygen was used for the operation; and the result was the knowledge of the constitution of nitrous acid.

Numerous other proofs of such accidental discoveries might be adduced, but the above suffice to prove the desirability of attentive and accurate observation in all your manipulations and experiments; and although you may not be so fortunate as Black, in discovering carbonic acid and latent heat, or Priestley, in the discovery of oxygen, or Scheele, chlorine, or Cavendish, the constitution of nitrous acid, water, and the diamond, or Davy, the alkaline metals, the construction and application of the Davy lamp,—for the latter being rewarded with the munificent sum of two thousand guineas,—yet, some positive benefit must result. In reference to the last philosopher, those of you who are not blessed with any large amount of self-confidence may take courage from the fact related of him, that he gave no early indication of superior genius or even of unusual quickness, but he showed all along, in following the bent of his intellectual taste, the perseverance, the firm purpose, which is inseparable from a capacity of the higher order, and is an indispensable condition, as it is a sure pledge, of success in every pursuit; and I need not announce to you there is yet an immense field open for discovery, and in no science perhaps is there a greater than in that of chemistry. In botanical science also, there is much yet hid from the knowledge of mankind; and the present dearth of cotton in this country has drawn especial attention to this subject, and numerous suggestions have been made of substitutes for that staple of our manufactures.

The recent announcement of the applicability of the *Zostera marina*, or sea-grass, for this exigency, caused a great sensation in the mercantile world, and indeed in the public mind generally, and we can only hope the anticipations thus raised may be fully realized. And, allied to this subject, I may remark that, viewing the enormous consumption of that most useful substance, paper, now in such universal demand both for literary and mercantile purposes, the unlimited cheap supply of a good raw material is a most important desideratum; and for the discovery of this we must confine our efforts to the vegetable kingdom, and we have every reason to expect, now that the Excise restrictions have been removed, that numerous experiments with new fibrous substances will be made. Many plants have been suggested, but none of these possessed all the properties required. To young men going abroad, especially into the tropical regions, where vegetation is so varied and profuse, a valuable field presents itself for the discovery of plants adapted both for the manufacture of textile fabrics and paper.

I much regret not being able to congratulate you on the appearance of the New Pharmacopœia. Upwards of twelve months ago, the secretary of the committee gave some expectation of its publication about the end of 1861 or early in 1862; but I can scarcely wonder at this prediction not being fulfilled, considering the great labour which must have devolved upon the committee in the preparation of a work of this character. The manuscript, however, is completed, and its publication only awaits some arrangements in reference to the copyright. You will also have noticed that the committee have intimated the necessity for the destroying or altering of all existing pharmaceutical preparations, where the strength or ingredients have been changed in the formula of the New Pharmacopœia. This being the case, it is very desirable that notice of the probable time when it is to come into effect should be given at the earliest period, so that pharmaceutists may be subjected to as little loss as possible. Another question, which I believe has not yet been settled, is the amount of authority to be attached to the work. Now I think it is essentially necessary that the British Pharmacopœia should be fixed as the national standard, and made such by Act of Parliament, and all others suppressed; otherwise pharmaceutists may find themselves subjected to much inconvenience, if each of the colleges which have hitherto published a Pharmacopœia determine to continue doing the same.

The question of weights has again been brought under discussion in some of the

journals, although it cannot be expected to have any effect, seeing that the committee have finished their task, and adopted the proposal of Dr. Wilson, whereby the grain weight has been altered, but the name still retained, giving us now two weights each called a grain, but different in value, thereby adding to the confusion.* Hitherto the grain weight has been free from this monstrous evil. We have long had two weights, each called a pound, two each called an ounce, and two each called a drachm; but unfortunately we have now three drachm weights, all differing in value. Three years ago this Association memorialized the committee, and respectfully suggested that the grain weight be not altered. The reason for changing the grain weight appears to have been the desirability of assimilating the divisions of the avoirdupois weights with the divisions of the present imperial measure: but this reason I still humbly think was scarcely sufficient to justify the alteration of the grain weight, although a certain amount of convenience will result to the medical practitioner and pharmaceutist. Difficulties present themselves to every proposed plan, but some are less objectionable than others. The change from one system of weights and measures to that of another, is always attended with considerable inconvenience and annoyance, and ought not to be made without very mature consideration, and almost absolute necessity.

The recognition of weights and measures of the same name, but having different values, and the changes which have occasionally taken place, have been the cause of all the confusion which at present exists. The committee appear to have had the question of an entirely new system of weights under discussion, but did not deem themselves competent to undertake such a task, considering that such a duty more properly devolved upon the Government. I cannot but think that the use of avoirdupois weights, down to one-eighth of an ounce, and the grain weights below or intermediate, would have met all requirements. With regard to the Government undertaking the duty of bringing forward some general comprehensive system adapted for every purpose, I think it is very desirable, and is now becoming urgent. A committee of the House of Commons on weights and measures was appointed some time ago, and if my memory serves me correctly, one of our respected members for Liverpool, Mr. Ewart, is on that committee, and I trust that something definite may be the result. But all changes of this character require a considerable time to bring them into operation. Soon after the revolution of 1789, the French Government proposed the decimal system which is used in France at the present time, but it was not until the year 1840, nearly fifty years after, that it was made compulsory by Act of the French legislature; thus giving abundance of time for becoming thoroughly conversant with the change. For several reasons I think it is to be regretted that the grain weight has been altered, it having become important as a unit of calculation. You will also recollect, that in order to arrive at the correct constitution of the one pound avoirdupois weight (through the swinging of a pendulum, etc.), you have to make use of the present grain, 7000 of which make the pound. Another objection to its change is the rendering of all specific gravity bottles useless, or otherwise continuing the use of the present grain weight; also tables for the conversion of one weight into another, or French grammes into English weights, and the necessity for designating all weights, when expressed in grains, either as new or old, thus rendering error very probable. Our trade throughout the country, more particularly those almost exclusively engaged in pharmacy and dispensing, are looking forward with great interest to its appearance, anticipating that the annoyances which at present beset their path will in a great measure be eventually removed.

With respect to the relative position which we as chemists and druggists occupy with the duly qualified medical practitioners, I hope that I may not be misunderstood if I venture to make a few remarks. During the past twelve months, discussions have been raised and opinions given, as to the peculiar province of our profession, its rights, and the position of its boundaries; and some, I am afraid, have too eagerly, and I may say injudiciously, advocated the assumption of a right to the practice of prescribing *ad libitum* over the counter, thus intruding into the province of the medical practitioner. I am not going to define the precise boundary beyond which we must not travel, for this very good reason, that it is next to an impossibility to do so satisfactorily, every circumstance furnishing data for its own solution, and by which alone

* It will be observed that since the above was written an important change has taken place.

we can form a correct opinion; but I do think it very desirable that we restrict ourselves as much as possible to our own legitimate profession, namely, that of chemists and druggists, or dispensing chemists and pharmaceutists, for I must confess that I am an advocate for the division of labour, as proficiency in any art or calling is more likely to be attained thereby. At the same time, I am aware that in these times of universal free trade, competition will often tempt us from our legitimate path, and this can scarcely be wondered at, considering the incursions which have been made upon our business during the last few years. It would indeed be difficult precisely to designate the proprietors of some large establishments in this and other towns, who are nominally called drapers, and who are ever ready to speculate and take advantage of any "tremendous sacrifice," anything from a halfpenny toy upwards. From the improvement which has taken place, generally speaking, in the education of the dispensing chemist, and the mode of conducting his business, during the last ten or fifteen years, I live in hope of seeing this carried to even a greater extent; and before the expiration of many years the dispensing of medicines, I trust, will devolve almost exclusively upon the educated pharmaceutist of the day; and I am not without hope that the medical practitioner may soon discover that it is more in accordance with the dignity of his profession, as well as advantageous to himself and patient, to discountenance the dispensing of medicine from his own surgery, and that that branch of the practice of physic more appropriately devolves upon the properly educated pharmaceutist, and by whom we may fairly expect this duty will be the most efficiently performed. In country places, and thinly populated districts, this change can hardly be expected to be realized; but in Liverpool, and in any town where there are two or three chemists' shops, there can be no reason why such a result may not be looked for.

Englishmen hitherto, generally speaking, could not be brought to comprehend precisely the exact value of professional advice alone, but required something of a more tangible character in exchange for the fee; hence the old practice of charging for physic only, but in reality the fee for advice included. But this custom, I am glad to say, is now almost universally discarded, and very properly so, and in the accounts now rendered by the surgeon, the term "professional attendance" is substituted; and I have no doubt that this wholesale and often unnecessary physic-taking in times gone by (for instance, half-a-dozen draughts, perhaps at eighteen pence or more each, sent to the patient at one time) contributed more towards the perpetuation of quackery than any other cause; and perhaps that giant delusion of the present day, namely Homœopathy, is explainable on similar grounds, it having run to the very opposite extreme, even into the arms of empiricism itself. And those of you who have not read Sir Benjamin Brodie's letter on this subject, written about twelve months ago, would do well to do so.

In this address, I have purposely abstained from any extended allusion to the chemical and pharmaceutical products in the International Exhibition, anticipating that some of those gentlemen who may have acquainted themselves more fully with the contents of that department will favour us in due time with a paper on the subject. And I may remark, that it was with much regret I was only able to spend a very short time in viewing the really splendid chemical productions which were exhibited, especially those of Lancashire.

In conclusion, I must apologize, gentlemen, for occupying so much of your time, but I hope that at our future meetings you will be favoured with papers of a much more interesting character from other friends of our Society; and I trust that the session may be quite equal to any of its predecessors, not only in the valuable character of the lectures and papers given, but also in the continuance of that friendly feeling which has hitherto characterized our gatherings.

The Second Meeting of the Session was held at the Royal Institution on Thursday evening, October 23rd; the President, Mr. J. Shaw, in the chair.

Messrs. E. Milner, J. H. Ellerbeck, A. Casartelli, W. H. Colby, R. Evans, J. T. King, and D. Cope, were elected members.

The following donations to the library were announced:—the Pharmaceutical Journal (5 numbers) from the Society; the 'Chemist and Druggist' from the Pro-

prietors; the 'Technologist' from the Editors; the 'Petroleum Act' from the President; and a 'Paper on the Manufacture of Caustic Soda' from the Secretary.

A vote of thanks to the several donors was passed unanimously.

Mr. DAVID COPE then exhibited his Patent Metallic Drum, for the carrying and storing of petroleum, naphtha, etc., and explained its manufacture and advantages. The cask appeared to meet with the general approbation of the meeting.

Mr. J. T. KING exhibited samples of deodorized Canadian Petroleum and crude Paraffin Oil.

The most interesting portion of the evening's proceedings was a lecture by Dr. J. B. Edwards on "Petroleum and the Products of its Distillation." Dr. Edwards, after introducing the subject, remarked that the flow of oil from mineral springs was by no means new either to science or commerce. Herodotus had recorded that the island of Zante furnished large quantities, while Pliny and Dioscorides described the oil obtained from Agrigentum, a small town in Sicily. The Persian springs at Bakoum had yielded to the value of £600,000 annually; and the earth oil from Rangoon, in Burmah, had been exported to the extent of 400,000 hogsheads yearly. The streets of Genoa and Amiens were formerly lit by a petroleum obtained from Parma. In 1847, a spring was discovered in Yorkshire, which was successfully worked by Mr. James Young, of Glasgow, until exhausted, when he turned his attention to the distillation of coal, and discovered paraffin oil. The marvellous oil springs of the New World, however, far surpassed in extent and interest all previous discoveries, and the quantity already yielded, without apparently diminishing the supply, showed that this would be a most important article of commerce for some years to come. In Canada the oil rose from the saturated corniferous limestones; in the States it was principally obtained from Devonian sandstones, while in Western Virginia and Ohio it rose directly from the coal-measures. In all cases it no doubt arose from the decomposition of coal by temperature and pressure, and was lifted by the percolation of water under it to cavities and fissures in rocks till it approached the surface, and it was generally accompanied by quantities of coal gas. Dr. Edwards here exhibited a variety of samples of Canadian and American petroleum, and distilled a portion of the latter, thereby showing an inflammable gas produced at a temperature below 100° Fahrenheit. He also gave the following results of experiments:—Petroleum has a specific gravity of from ·820 to ·830 at 60° Fahrenheit. At this temperature some samples ignite upon the surface upon application of a light; others require raising to a temperature of 80° Fahrenheit, when they inflame and burn fiercely. It begins to boil at 100° Fahrenheit, and upon continuing to raise the temperature to 280° Fahrenheit, it yields about 8 to 10 per cent. of very light volatile spirit. From 300° to 500° Fahrenheit a second sustained ebullition occurs, yielding about 25 to 30 per cent. of a clear spirit of a less inflammable nature; and again, at 600°, about 15 to 20 per cent. of spirit distils, leaving 30 to 40 per cent. of a tarry fluid called "dead oil." Of the product, about 30 to 40 per cent. may be burned as a lamp oil, and is known as kerosine or photogen, which has a specific gravity of about ·810 to ·820, and the vapour does not ignite under 110° Fahrenheit. It boils at about 230°. It is, however, a mixture of different spirits, and the quantity and quality depend greatly upon the temperature employed in the distillation. Pursuing his subject, the lecturer said American benzol or benzine was a mixture of the lighter portions of the spirits, and was not safe to burn in lamps, as it ignited at ordinary temperatures, and boiled at 160° Fahrenheit. It yielded a variety of lighter oils by distillation. It was used in paint as a substitute for turpentine, and contained a very light spirit called kerosolene, which was more volatile than ether, and produced insensibility when its vapour was inhaled, and all the effects of chloroform. Its specific gravity was about ·650, and it burned at ordinary temperatures with explosive violence; boiled and entirely distilled at 150° Fahrenheit. (Samples of these products were shown and tested, also solid paraffin, and a hard wax resembling spermaceti, prepared from the "dead oil," and a candle made from this wax was shown and burnt.) The lecturer then commented upon the recent Act of Parliament requiring licences for storing the more combustible of these spirits, which Act, however, did not apply to the burning oil. For testing the safety of these oils an ingenious apparatus by Casertelli was shown and illustrated. The chemistry of the subject was next illustrated by the separation of

charcoal from the oil by chlorine, and the combustion of the hydrogen by oxygen gas. The latter experiment caused a violent explosion, showing how dangerous was the admixture of these vapours with atmospheric air, their composition resembling that of coal gas. In conclusion, Dr. Edwards exhibited the electric light as an illustration of the purest form of artificial light obtained by the incandescence of carbon.

At the conclusion of the Lecture,

Mr. J. C. Gibson said he would like to ask Dr. Edwards whether he thought any danger from explosion was likely to arise to ships carrying petroleum in iron tanks. He (Mr. Gibson) stated that he was at present building a ship to be fitted with large iron tanks, sufficient to hold 1200 tons of petroleum.

Dr. Edwards thought no danger could arise from the use of iron tanks, and he considered it an admirable and safe method of carrying petroleum.

Mr. Martin Murphy remarked with reference to explosions, that petroleum may be stored with perfect safety in any vessel as long as air is excluded, as it is only upon becoming mixed with the air that the petroleum vapour became explosive. He thought that the products of petroleum designated "benzine" should not be called by that name, as petroleum does not contain any of the true benzine. He had examined a large number of samples, but had not been able to find more than a slight trace of benzine in any one of them, and that he believed had been formed by decomposition during his experiments. From the result of his own experiments he was led to believe that petroleum consisted of hydrocarbons of the series $C_n H_n$.

Mr. N. Mercer said he had hoped to hear some person say a kind word for petroleum. The oil had been much libelled by the way in which it was denounced on the ground of accident. He thought that the public ought to be informed that the dangerous properties of petroleum were not peculiar to that article, but that danger was quite as likely to arise from other things from the same causes—from coal gas, for instance. The use of the oils was increasing daily, notwithstanding the depreciating remarks made concerning them. Many persons, from interested motives, had spoken strongly against the burning oils, and applied remarks to them which were only applicable to kerosolene, and the other lighter products of petroleum. He considered that it could not be too widely spread that accident was no more liable to result from the use of the petroleum burning oils, than it was from the use of any other of the oils employed for lighting purposes; and he asserted that there was not a single case in which accident, properly speaking, could be charged to these oils. The bulk of the American oils for burning purposes were perfectly safe, and he had never met with a single specimen that might be said to be highly dangerous.

Mr. H. Bird said that many persons considered the vapour of petroleum to be unhealthy; but he had tried its effect upon mice, by placing them in a vessel filled with the vapour, and had not found it to have any injurious effect upon them.

Mr. Abraham remarked that petroleum contained in a tank or other vessel was not liable to cause explosion as long as the vessel was quite full; but if it was only partly filled, air would enter, and mixing with the vapour would form an explosive mixture. He thought that the escape of vapour from vessels holding petroleum might be prevented by causing any vapour that may be disengaged to come in contact with a layer of water, which would afford an obstacle to its escape.

Mr. A. N. Tate said, that with reference to the remarks which had fallen from Mr. Mercer, he fully agreed with that gentleman that no danger could arise from the use of properly prepared burning oils obtained from petroleum, but that the danger was caused by the substitution of the lighter products for the lamp oils by the dealers, and also by the lighter products not being properly separated from the burning oils in the process of refining. There were two or three articles sold under the name of petroleum oil; and, he could speak from experience, having purchased several samples, that the shopkeepers when asked for petroleum oil did not trouble to inquire for what purpose it was required, but gave what they thought proper, and that in this way the substitution of the lighter oils for the lamp oil may occur.

A vote of thanks to Dr. Edwards for his lecture closed the proceedings.

The Third Meeting of the Session was held at the Royal Institution on Thursday, November 6.

The PRESIDENT in the chair.

The following gentlemen were elected members of the association:—Messrs. J. D. Kelly, W. Cleland, Henry Brunner, G. J. Wells, W. Walker, J. M. Frank, W. Nicholson, J. Cottingham, T. C. Gibson, and W. Meadows.

The SECRETARY announced the following donations:—To the library: Gregory's 'Outlines of Chemistry' and a List of Medals and Honourable Mentions awarded by the Jurors of the International Exhibition, from Mr. N. Mercer, ten volumes of the Pharmaceutical Journal from Mr. Fryer, and the 'Technologist' for November from the editor. To the museum: a series of specimens of Petroleum and its products from Messrs. Holt and Banner, and a sample of *Areca Catechu* from Messrs. Johnson and Liversedge.

Dr. NEVINS exhibited an interesting series of specimens of the products from Opium, and made some remarks concerning their properties.

In the course of a conversation which afterwards ensued, Cinchonine was mentioned, and it appeared to be the opinion of several members that this article was likely to become a valuable substitute for Quinine, inasmuch as its medicinal effects were almost the same, and its price much lower.

Mr. MARTIN MURPHY then read the Paper of the evening, "On Ammonia and its Compounds."

At the conclusion of the lecture, a vote of thanks was passed to Mr. Murphy and to the donors to the library and museum.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG.

(*Continued from page* 107.)

VI. SANGUINARIA CANADENSIS, *LINN.*—BLOOD-ROOT, PUCCOON.

HISTORY.—Under the names of Puccoon, Indian Paint, etc., the rhizome and rootlets of this plant have been used for centuries by the Indians of North America, both as a medicine and as a paint and dyeing agent. It has been also long esteemed as a medicine by irregular medical practitioners and in domestic practice, and is at present much employed by the Eclectics. The attention of the medical profession in America appears to have been first called to it in the year 1803, by Dr. Downey, of Maryland; afterwards by Dr. Bigelow, in 1806; then by Dr. Fitzgerald Bird, in 1822; and more especially by Dr. Dana, of New York, in 1824, who discovered in it a new alkaloid, which he called *Sanguinarina*.* The latter discovery soon led to its employment in the practice of the regular medical practitioner, and it was afterwards introduced into the United States Pharmacopœia, where it is still retained in the Materia Medica, and a formula for the preparation of a tincture from it is ordered. It is now a good deal employed in regular practice in the States of North America.

It has been known in Europe since the early part of the 17th century, for in 1635 it was described by Cornuti, in a work published by him, in Paris, entitled, 'Historia Canadensium Plantarum,' under the name of *Chelidonium maximum canadense acaulon*. Previous to this period, it must have been cultivated in France, as Cornuti's description was taken from fresh specimens.† In 1640, it was described by Parkinson, in his 'Theatrum Botanicum,' and hence was probably then cultivated in the gardens of this country. It was afterwards alluded to by Morison in 1680; afterwards by Charlevoix, in his 'His-

* Ann. Lyc. Nat. Hist. New York, vol. ii. p. 250.

† British Med. Journ. for 1860, p. 89.

toire de la Nouvelle France ;' and more especially by Dillenius, in the 'Hortus Elthamensis,' where it is first named *Sanguinaria*, to which the specific name, *canadensis*, was afterwards given by Linnæus.* A few years since it was brought prominently into notice in this country by Dr. J. W. Fell, who employed it as a local remedy in cancer, when made into a paste with flour and water, after admixture with chloride of zinc. Some able papers were afterwards published in this Journal by Dr. Gibb,† and in the 'British Medical Journal' for 1860, highly extolling its virtues, both as an external application and as an internal remedy in several diseases. At present, however, it has not found much favour in this country. The paper of Dr. Gibb, already published, as just noticed, in this Journal, renders it necessary only for us, in this place, to refer more especially to those portions of the subject which have been but briefly noticed by him, and which have an especial interest to pharmaceutical readers.

Synonyms.—This plant is the *Sanguinaria canadensis*, Linn., Spreng., Michx. Fl. vol. i. p. 309, Bot. Mag. tab. 162, Bigelow, Med. Bot. vol. i. p. 75, plate 7, Nutt. Gen. vol. ii. p. 9, DC. Prod. vol. i. p. 131, Hook. Fl. Bor. Amer. vol. i. p. 35, Willd. Sp. Plant. vol. ii. p. 1140, Barton's Med. Bot. vol. i. p. 31, and Torr. and Gray's Fl. N. Am. vol. i. p. 62. It is the *Sanguinaria acaulis*, Mœnch, the *S. virginiana*, Gært., and the *S. stenopetala*, Otto. The first name is that now generally adopted, both in botanical and medical works.‡ In common language it has been termed Bloodroot, Puccoon, Red Puccoon, Red root, Bethroot, Indian Paint, Indian Turmeric, etc.

The generic name, *Sanguinaria*, is derived from *sanguis*, blood, in consequence of the blood-red colour of the juice which flows from its rhizome and petioles when wounded. The specific name, *canadensis*, was applied to it by Linnæus, to mark the habitat from which he obtained it. The common names of the plant are also derived from its leading peculiarities and uses.

Botany.—*Sanguinaria canadensis* was placed by Jussieu in his Natural Order *Papavera*, and by Necker, in the *Catizophita*. It is now universally placed by botanists in the Natural Order *Papaveraceæ*.

Generic Character.—*Calyx* of 2 sepals. *Petals* 8–12. *Stamens* 24. *Stigmas* 2. *Fruit* capsular, oblong, 2-valved, ventricose, acute at each end. *Placentas* filiform, persistent.§

Specific Character.—This, which is the only known species of *Sanguinaria*, is an herbaceous perennial. *Rhizome* perennial, creeping, discharging when wounded, an acrid orange-red-coloured juice. *No aerial stem. Leaves* radical, reniform or cordate-reniform, solitary, with long channelled petioles, palmately lobed, smooth and strongly reticulated on the under surface. Each leaf is accompanied by a solitary flower-bud, which it at first completely infolds. *Scape* solitary, 1-flowered, erect, round, smooth. *Sepals* 2, deciduous. *Petals* white, or tinged with rose or purple, 8 naturally, although frequently increased by cultivation. *Stamens* numerous. *Style* none. *Fruit* oblong, 2-valved. *Seeds* numerous, dark, shiny, reddish-brown, half surrounded by a white vermiform appendage.‖

Habitat.—It is a common plant in the woods of Canada and the States of

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* See a paper on *Sanguinaria canadensis*, by Dr. Gibb, in the 'British Medieal Journal' for 1860, for some interesting details on the history, of this plant.

† Pharm. Journ. vol. i. 2nd ser. p. 454.

‡ Good plates of this plant may be seen in the 'Botanieal Magazine,' and in Gray's 'Genera of the Plants of the United States,' vol. i. tab. 49.

§ Torrey and Gray's 'Flora of North America,' vol. i. p. 62; Gray's 'Genera of the Plants of the United States,' vol. i. p. 115; and Lindley's 'Flora Medica,' p. 16.

‖ Lindley's 'Flora Mediea,' p. 16; Torrey and Gray's 'Flora of North Ameriea,' vol. i. p. and Lindley's 'Medieal and Economic Botany,' pp. 154 and 155.

North America. According to Torrey and Gray,* it occurs in open woods, in light soil, etc., from Canada to Florida, and west to the Mississippi. Dr. Gibb says, "Canada is essentially the country of the Blood-root; I have seen it growing in various parts of that division of the British Empire. It is found as far eastward as Labrador, and to the north of the Saskatchevan, on the eastern side of the Rocky Mountains. It spreads south, and is found in all the States of the American Union, living in various kinds of soils, derived from various geological formations, and to some extent varying in the delicacy and appearance of its leaves. The root everywhere appears to be the same."† It flowers early in the spring, in March and April, as soon as the frost and snow disappear. It is one of the most beautiful as well as earliest of the spring flowers of North America. It may be frequently seen in the gardens of this country and in other parts of Europe.

Collection, etc.—According to Wood and Bache, all parts of the plant, except the seeds, possess active properties.‡ The rhizome is, however, the only part in common use, and that alone which is officinal in the United States Pharmacopœia. We should regard the autumn, or, still better, the early spring before vegetation has actively commenced, as the best season for collecting it, as at that period, judging from analogy, it would be in the most active condition. Dr. Gibb, however, says, "its virtues will be found to be the greatest when the seeds are ripe, in May and June." §

General Characteristics.—The *rhizome*, or *root* as it is improperly called, is found commonly in commerce in two states,¶ that is, either with, or without, attached or loose rootlets. In some cases the two kinds are mixed in the same sample, under which circumstances, many of the rootlets are separated from the rhizomes and lie loosely distributed amongst them.

The *rhizome* usually varies in length from about half an inch to two inches and a half, averaging about one inch and a half; although occasionally pieces may be found as much as three or even four inches long. In thickness it varies from about a quarter to half or three-quarters of an inch, averaging about half an inch. It has an irregular cylindrical shape, more or less flattened above and below; it is generally much wrinkled, and marked with annular ridges and irregular longitudinal striæ.‖ Many of the specimens present deep contractions at short intervals, in which case they assume a moniliform or beaded appearance. The larger rhizomes are sometimes branched, and are usually twisted, and present small protuberances on their surface. The latter are sometimes half an inch or more in length, and are then seen clearly to be little tubers, or rather tubercular expansions attached to the rhizome. The rhizomes have a dark reddish-brown, bright colour, when freshly dried, but they become duller and of a deeper brown by keeping. They have a firm texture, and a short, close, resinous-like fracture.

A transverse section of the rhizome presents a large central mass occupying the larger proportion of the exposed surface, and of a bright orange-red colour; this is surrounded by a dark reddish-brown ring, which is sometimes interrupted by lighter whitish or greyish radiating lines. By keeping, the colour of both portions becomes darker and duller. In some specimens three distinct parts may be observed in the transverse section: *one*, in the centre, of a dark reddish-brown colour; *another*, on the outside of the section, also

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* 'Flora of North America,' vol. i. p. 62.

† Dr. Gibb, "On Sanguinaria canadensis, its Natural History, Properties, and Medical Uses," 'British Medical Journal' for 1860, p. 89.

‡ Wood and Bache's 'United States Dispensatory,' 11th edit. p. 678.

§ Gibb "On Sanguinaria canadensis," Pharm. Journ. vol. i. 2nd ser. p. 455, and British Med. Journ. for 1860, p. 89.

‖ For figures of these rhizomes, see Pharm. Journ. vol. i. 2nd ser. p. 455.

of a dull, dark, reddish-brown hue; and the *third* placed between these two and forming a bright orange-red ring. In other cases, the large central mass, which is commonly, as noticed above, of a bright orange-red colour, has a light yellowish-red colour, which is interspersed by irregular, somewhat stellate spots, of a bright orange-red or deep yellowish-brown colour.

In those specimens of *Sanguinaria* rhizomes, where attached rootlets are found, the latter are commonly numerous, from an inch to six or seven inches in length, and arise from the sides and under surface of the rhizomes. These rootlets in commercial specimens are usually twisted round the rhizomes or lie in close contact with them. They are about as thick as a common bristle, and have a lighter colour than the rhizomes, although varying in this particular from brownish-red to light yellow-brownish-red.

The rhizomes have a faint, peculiar, feebly narcotic odour. Their taste is unpleasantly bitter and acrid when chewed for a short time; they have also a very slight narcotic taste under similar conditions. The acridity lasts for a long time. The rootlets have a somewhat similar taste and odour, but not so marked; hence from these peculiarities, as well as from their chemical and other properties, I should regard them as less active than the rhizomes. In all cases, the rhizomes should not be used if they have been long kept, as their virtues are said to be rapidly deteriorated by time.*

Sanguinaria rhizomes have a great resemblance in shape and general appearance to *long turmeric* rhizomes, but these may be at once distinguished, by the lighter colour of their external surface, which is yellowish brown, instead of, as in the former, reddish brown. They have also some resemblance to *tormentilla rhizomes*, but these are darker-coloured than those of *Sanguinaria*. The shape of tormentilla rhizomes is also different from them, and internally, they present a dull reddish-brown colour, instead of the bright orange-red hue of the Sanguinaria rhizomes.

Composition and Chemical Characteristics.—The chemical composition of the rhizomes of *Sanguinaria canadensis*, and the nature, reactions, and general properties of the substances which they contain, having been already so fully treated of in our pages† by Dr. Gibb, we refer our readers to his paper for minute details, and content ourselves here with a few general observations, to which we append a notice of the reactions according to our own observations and experiments. According to the experiments of Dana,‡ Dr. James Schiel,§ Riegel,|| Probst,¶ Wayne,** of Dr. Gibb as noticed above,†† and others, the composition of the rhizomes is as follows:—*Sanguinarina, porphyroxine, puccine, chelidonic acid, fecula, saccharine matter, vegetable albumen, orange-coloured resin, fixed oil, extractive matter, lignin,* and a little *gum.*

Sanguinarina is a poisonous alkaloid,‡‡ and is, as shown by Schiel, identical with *chelerythrina*, one of the alkaloids discovered by Probst in the common celandine (*Chelidonium majus*). Schiel gives the following process for preparing this alkaloid:—"Digest the root with water strongly acidulated with sulphuric acid, precipitate with ammonia, dry the precipitate, dissolve it in ether, treat with animal charcoal, filter, and precipitate with sulphuric acid dissolved in ether. A pure sulphate is thus obtained, which may be decom-

* Wood and Bache's 'United States Dispensatory,' 11th edit. p. 679.
† Pharm. Journ. vol. i. 2nd ser. p. 456.
‡ Ann. Lyc. Nat. Hist. New York, vol. ii. p. 250, and United States Disp. 11th edit. by Wood and Bache, p. 679.
§ Silliman's Journ. N. S. vol. xx. p. 220.
|| Chem. Gaz. vol. iv. p. 197.
¶ Phil. Mag. January, 1843.
** Amer. Journ. Pharm. vol. xxviii. p. 521.
†† Pharm. Journ. vol. i. 2nd ser. p. 456, and Brit. Med. Journ. for 1860, p. 89.
‡‡ Annal. der Pharm. vol. xxix. p. 113.

posed in the ordinary method, to obtain the alkaloid."* The alkaloid as thus prepared is a white pearly substance, having a bitter and acrid taste, very sparingly soluble in water, but soluble in ether and in the fixed and volatile oils, and very soluble in alcohol. With acids it forms soluble salts, which are remarkable for their beautiful red, crimson, and scarlet colours, and for forming beautiful red solutions. These salts are acrid and pungent to the taste, particularly the muriate and acetate. From these facts, it would appear that the red colour and acrid properties of the rhizome may be owing to the presence of some native salt of sanguinarina, which is decomposed by ammonia in the separation of the organic alkali.† Mr. Wayne believes that the acrid and pungent taste of the rhizome is probably due to the *chelidonate of sanguinarina*.‡

This alkaloid, *sanguinarina*, should be carefully distinguished from the resinoid extract of Sanguinaria, the so-called *alka-resinoid*, termed *sanguinarin*, which is the remedy chiefly employed in eclectic practice, and which is regarded by such practitioners as containing in itself all the more important active constituents of the rhizome. This *sanguinarin* is thus prepared :— "Take of bloodroot in coarse powder a convenient quantity, and alcohol sufficient; make a saturated tincture, as in the case of the other resinoids ;§ filter, and add an equal quantity of water ; distil off the alcohol, and allow the residue to rest until precipitation ceases. Remove the supernatant liquid, wash the precipitate in water, dry it carefully by moderate heat, and pulverize it for use. As thus prepared, the powder is of a deep reddish-brown colour, peculiar odour, and bitter, rather nauseous taste, which is followed by a persistent pungency in the fauces. It is insoluble in water, soluble in boiling alcohol, and partially soluble in alkaline solutions, acetic acid, and ether." ||

An infusion of the bruised rhizomes, in the proportion of one ounce in twenty-four ounces of boiling water, and allowed to macerate for about twenty hours, had a light orange-red brownish colour, and possessed a slight, faintly narcotic, and peculiar odour, and a bitterish, and slightly acrid and narcotic taste. It exhibited the following reactions :—*Blue litmus paper* was slightly reddened ; *tincture of iodine* produced a deep violet-black coloration ; *solution of perchloride of iron*, a slight temporary brownish-black colour, but no perceptible precipitate ; *solution of persulphate of iron*, a slight brownish-black colour ; the same reagent when added to an infusion of like strength, but after two days' maceration, produced a plentiful precipitate ; *solution of ferrocyanide of potassium* made the infusion slightly cloudy ; *solution of the basic acetate of lead* produced an abundant yellowish-white precipitate ; *solution of acetate of lead*, a whitish floating precipitate ; *solution of sulphate of copper* changed the colour to light yellow ; *solution of nitrate of silver* had no marked effect at first, but it ultimately caused a blackish precipitate ; *solution of bichloride of platinum* rendered the infusion slightly opaque ; *solution of oxalate of ammonia* caused a very slight precipitate ; the *solutions of ammonia* and *carbonate of potash* produced no evident change, except that of lessening the colour of the infusion ; *solution of protochloride of tin* caused a plentiful flocculent precipitate ; and the *solution of potassio-*

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* Silliman's Journ. Sept. 1855, and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 679.

† 'United States Dispensatory,' 11th edit. p. 679 ; and Parrish's 'Practical Pharmacy,' 2nd edit. p. 398.

‡ Amer. Journ. Pharm. vol. xxviii. p. 521, Nov. 1856.

§ See the papers by the author on *Actæa racemosa*, Pharm. Journ. vol. ii. 2nd ser. p. 462 ; and on *Podophyllum peltatum*, Pharm. Journ. vol. iii. 2nd ser. p. 461 ; and Parrish's Pract. Pharm. 2nd edit. p. 191.

|| Parrish's 'Practical Pharmacy,' 2nd edit. p. 193.

tartrate of antimony made the infusion cloudy, and ultimately a very slight precipitate appeared. The solutions of *nitrate of baryta*, *chromate of potash*, *chloride of calcium*, *sulphate of lime*, and *antimoniate of potash*, had no marked effect; and the same was the case when *tincture of galls*, and *acetic*, *nitric*, *hydrochloric*, and *sulphuric acids*, were added to the infusion.

When *sulphuric acid* was applied to a transverse section of the rhizome, its colour was rendered more intense and became bright blood-red. *Nitric acid*, added in a like manner, produced a deep reddish-brown coloration on the outer cortical portion of the section, and a bright blood-red in the central part, or meditullium. When *hydrochloric acid* was applied to the transverse section, the whole surface assumed a bright arterial-red colour.

Medicinal Properties and Uses.—According to Dr. Gibb,* "Sanguinaria possesses emetic, nauseant, expectorant, diaphoretic, narcotic, sedative, stimulant, and alterative properties. It acts also as an emmenagogue, escharotic, and errhine. Occasionally it exerts a diuretic, purgative, anthelmintic, and antipsoraic effect. It is said to be prophylactic. All these are regulated by the dose and form in which it is administered; it is, however, chiefly valuable for its emetic and expectorant powers, and its action as an emmenagogue." When given in too large doses, it produces burning sensation in the stomach, great emesis, intense and distressing thirst, faintness, vertigo, dimness of vision, and great prostration.† Four persons lost their lives, at New York, by partaking of tincture of Sanguinaria in mistake for ardent spirit.‡ In its properties generally, it is considered by many writers to be allied to Senega root. It must be considered as somewhat remarkable, and more especially so, as Sanguinaria is officinal in the United States Pharmacopœia, that Dr. Stillé, in his valuable work published in America, 'On Therapeutics and Materia Medica,' does not in any way allude to it.

It has been used in pneumonia, phthisis, bronchitis, catarrh, asthma, hooping-cough, croup, diphtheria, scarlatina, rheumatism, hepatic diseases, amenorrhœa, influenza, dysentery, intermittent fever, diseases of the skin, constipation, scrofula, dyspepsia, and in various other medical and surgical diseases.§ As an external and internal remedial agent in cancer, for which it was reputed to be very efficacious, it has been found to be quite useless. As an excitant to the liver, it is reputed to be a very valuable remedy.‖

Besides its use in medicine, Sanguinaria has some claims to notice on account of its economical uses. Thus, the juice of the fresh rhizome has been employed from the earliest periods by the North American Indians, to paint the bodies of their warriors, and as a dye for baskets, ornaments, domestic utensils, etc. It has also been used in the States for dyeing woollen cloths and flannel of an orange colour. It is also employed in France for dyeing silks and muslins.¶

By expression, the seeds yield a bland, nutritious, and colourless oil, which has been employed medicinally for cattle; and the cake left after the oil has been expressed, is said to form a nutritious food for cattle.**

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* British Med. Journ. for 1860, p. 90.

† Wood's 'Therapeutics and Pharmacology,' vol. ii. p. 440.

‡ Am. Journ. Med. Science, N. S. vol. ii. p. 506; and 'United States Dispensatory,' 11th edit. p. 679.

§ Brit. Med. Journ. as above, pp. 105, 106; and Dr. Grover Coe's 'Concentrated Organic Medicines,' p. 384.

‖ Wood's Amer. Quart. Retrosp. vol. ii. p. 80. For full details of the medicinal uses of Sanguinaria, see Dr. Gibb's paper in the 'British Medical Journal' for 1860; Trans. Amer. Med. Assoc. 1849, vol. ii. p. 690; and Dr. Grover Coe's work 'On Concentrated Organic Medicines.'

¶ Gibb, on Sanguinaria, Pharm. Journ. 2nd ser. vol. i. p. 460; and Bouillet's Dict. Univ. des Sciences, Paris, 1854.

** Simmonds's 'Commercial Products of the Vegetable Kingdom.'

Administration, Doses, and Preparations.—Sanguinaria rhizome has been administered in powder, and in the form of infusion, extract, decoction, syrup, wine, etc.; and externally, mixed with lard, as an ointment, and as a paste combined with chloride of zinc, etc. The tincture, and resinoid extract (sanguinarin), a process for the preparation of which we have already given (page 267), are most in use. The tincture is officinal in the United States Pharmacopœia, and is prepared as follows:—

Tinctura Sanguinariæ, *Tincture of Bloodroot.*—"Take of bloodroot, bruised, *four ounces*, Troy; diluted alcohol, *two pints* (of sixteen fluid ounces). Macerate for fourteen days, express, and filter through paper.

"This tincture may be also prepared by thoroughly moistening the bloodroot in powder, with diluted alcohol, allowing it to stand for forty-eight hours, then transferring it to a percolator, and gradually pouring upon it diluted alcohol, until two pints of filtered liquor are obtained."

The diluted alcohol of the United States Pharmacopœia is prepared by mixed alcohol and distilled water in equal proportions, and should have the specific gravity of 0·935.

The infusion and decoction of Sanguinaria may be prepared by adding half an ounce of bruised rhizomes to sixteen fluid ounces of boiling water.*

The dose of the powdered rhizome, as an emetic or as a pill, is from ten to twenty grains, and for other purposes from one to five grains, repeated at intervals according to circumstances and required effect. The dose of the tincture as an emetic, is from two to four fluid drachms; and as a stimulant, expectorant, or alterative, for which purposes it is more especially intended, from twenty to sixty drops may be given.† The emetic dose of the infusion and decoction, as prepared above, is from half a fluid ounce to a fluid ounce.‡ The dose of the alkaloid (*sanguinarina*) is from *one-thirtieth* to the *tenth* of a *grain*. The dose of the resinoid, alka-resinoid, or resinoid extract (*sanguinarin*), is, according to Parrish,§ as a tonic, from *one-fourth* to *one grain*, and as a hepatic and alterative, from *half a grain* to *two grains*. The author of 'Positive Medical Agents'‖ gives the dose as an emetic *two grains*, which in certain cases may, he says, be increased to *four grains*. Dr. Coe¶ states that sanguinarin may be given in doses of from *one-fourth* to *one-half a grain*, twice a day, in syphilitic eruptions and other diseases of the skin; and in hepatic affections, etc., in doses of from *one-eighth* to *one grain* twice a day. The doses as quoted above from Parrish are those more commonly given.

APIOL.

In the year 1849, the Society of Pharmacy of Paris proposed for competition the following inquiry:—To discover a means of artificially preparing Quinine, that is, without the employment of Cinchona Bark, or any substance contaning quinine ready formed. In default of this, to make known a new organic product, natural or artificial, possessing [medicinal] properties equivalent to quinine, and which would be capable of competing commercially with it.

Nine memoirs, professing to reply to this inquiry, were addressed to the

* For further particulars of the administration and preparations of Sanguinaria, see Dr. Gibb's Paper in the Pharmaceutical Journal, vol. i. 2nd ser. p. 461.

† United States Disp. 11th edit. p. 1317; and Wood's 'Therapeutics and Pharmacology,' vol. ii. p. 441.

‡ Pereira's Mat. Med. vol. ii. part 2, 4th edit. p. 661.

§ Parrish's Pract. Pharm. 2nd edit. p. 193.

‖ "Sanguinarin," p. 155.

¶ 'Concentrated Organic Medicines,' p. 338.

Society, among the number being one by Drs. Joret and Homolle, upon an alleged new febrifuge named by them *Apiol*. This memoir, although not completely resolving the question, and consequently not deemed worthy of the prize, was yet considered to deserve special encouragement, and an abstract of it, prepared by M. Dubail, appeared in the 'Journal de Pharmacie et de Chimie.'* From this abstract and from MM. Joret and Homolle's 'Mémoire sur l'Apiol' (Paris, V. Masson, 1855, 8vo) we gather the following facts.

That the febrifuge virtues of certain European umbelliferous plants, such as *Smyrnium Olusatrum* L., *Imperatoria Ostruthium* L., *Apium graveolens* L., *Phellandrium aquaticum* L., etc., have from time to time attracted the notice of physicians, and that even the juice and other preparations of common parsley (*Apium Petroselinum* L.) have been employed in cases of fever with more or less success. It was not however until the year 1847, that an accidental circumstance induced one of the authors to make some experiments upon the seeds of the last-named plant, which experiments proved eminently encouraging. This led to a chemical examination, the results of which may be thus stated. Parsley seeds contain :—

1. A volatile oil.
2. A crystallizable solid fatty substance, fusible at 73° F.
3. Pectine (the *apiine* of Braconnot).
4. Chlorophyll.
5. Tannin, yellow colouring matter, extractive, woody matter, and inorganic salts.
6. A yellow, oily, non-volatile liquid, denser than water, having a peculiar taste and smell. This liquid to which the name of *apiol* was given, was determined to be the principle to which exclusively the antiperiodic virtues of the seeds are due.

The method recommended for the preparation of apiol is the following :— Powdered parsley seeds are to be exhausted with alcohol of sp. gr. 890 to 864; the tincture obtained is to be treated with animal charcoal and then evaporated in a water-bath until three-fourths of the alcohol have been recovered. The residue is to be treated with ether or chloroform, and the solution so obtained is to be evaporated (finally by a stove-heat) until all trace of either menstruum has been expelled. A liquid remains which is to be triturated with an eighth of its weight of litharge and then allowed to subside during forty-eight hours. Finally it is to be filtered through a thin layer of charcoal, which will render it nearly colourless. The product so obtained is called *apiol*.

In this state apiol possesses the following properties; it has the peculiar and tenacious odour of parsley seeds, but not the terebinthinous smell of the essential oil; it has an acrid and pungent taste, especially felt in the fauces. Its density at 53° F. is 1·078; at 10° F. it becomes turbid, but without solidifying, regaining its transparency upon an elevation of temperature. Heated to a temperature of from 300° to 350° F. it disengages some bubbles; at 428° F. it becomes coloured without apparently any modification in odour or taste and without loss in weight; it is therefore not volatile. Burned upon a platinum slip, it leaves no fixed residue. It is insoluble in water, whether cold or hot, very soluble in alcohol of sp. gr. ·934 to ·834, and dissolves in all proportions in ether or chloroform. Chlorine does not sensibly alter either the odour or taste of apiol, but it produces in it a slight blackish precipitate. Potassium immersed in it, rapidly becomes covered with bubbles and disintegrates, indicating the presence of oxygen. Apiol contains no

* Tome xxviii. (1855) p. 212.

nitrogen. Treated with sulphuric acid, it behaves like copaiba, acquiring a beautiful red colour, and solidifying with the loss of both odour and taste; it decomposes nitric acid violently, becoming converted into a yellowish resin. It has no action upon hydrochloric acid, but is completely soluble in acetic acid. It forms an emulsion with potash or soda; an ammoniacal emulsion exposed to the air loses its ammonia, the apiol regaining its original condition. An alcoholic solution of apiol slightly reddens litmus and syrup of violets. The same solution treated with an alcoholic solution of acetate of lead becomes turbid, the turbidity disappearing upon heating and reappearing as the liquid cools.

Drs. Joret and Homolle, says M. Dubail, consider that apiol is an immediate principle, allied in its nature to fixed oils. In its density it differs from analogous organic products; while most of the reactions which it produces with reagents are (with the exception of that with acetate of lead) purely negative.

Apiol is recommended as a powerful febrifuge; it may be administered in doses of five or six drops (two and a half or three grains) diffused through any bland liquid,* or in the form of capsules, four of which contain one gramme or fifteen and a half grains. In cases of intermittent fever, two to four capsules may be given daily in one dose five or six hours before the paroxysm. Apiol may also be prescribed in the form of a syrup prepared thus:—Apiol five parts, white sugar a thousand parts. Mix together and dissolve with a gentle heat in distilled water five hundred parts; filter and preserve for use. Of this syrup two and a half fluid ounces contain only five grains: hence the necessity of a larger dose of sugar than would often be convenient.

According to Drs. Joret and Homolle, apiol has also been usefully employed as an emmenagogue in doses of three to five grains *per diem*, and has likewise proved beneficial in the night perspirations of phthisis.

ORIGIN OF ANACAHUITE WOOD.

BY DANIEL HANBURY, F.L.S.

It is now about two years since the name of this drug appeared in the German pharmaceutical journals, as a new remedy for consumption. Shortly subsequent to this period large quantities of Anacahuite Wood were imported from Tampico, and extensive trials were made in Germany in order to determine whether the good effects which the wood was stated to produce in Mexico could be realized in Europe also. Chemical analysis† was also resorted to in order to discover whether it possessed constituents that could in any way explain its alleged beneficial action. The results of all this labour were by no means favourable to the new drug; its valuable effects in phthisis could not be observed; analysis did not indicate that it possessed any important medicinal properties, and as a natural conclusion, anacahuite wood was thrown aside as a remedy of no value.

One question however remained, and that was: What plant is it which yields this drug? Upon this point until recently no information could be obtained. Dr. Otto Berg of Berlin, Dr. Berthold Seemann of London, and myself,‡ consulted all the authorities at our disposal, but without arriving at any positive conclusion. I also put myself in communication with Lieutenant

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* The following is a good formula:—R. Apiol gr. v. Syrupi f℥ij. Pulv. tragacanth. co. ℈j. Aq. dest. ad f℥xx. Misce. [Each fluid ounce will contain two grains of apiol.—Ed. Ph. J.]

† Buchner, *Ueber das Anacahuite-holz*, in *Neues Repertorium für Pharmacie*, Bd. x. (1861) p. 97; also Müller, in *Vierteljahresschrift für Prakt. Pharm.*, Bd. x. p. 519.

‡ Pharm. Journ. and Trans., 2nd Series, Vol. II. p. 407, Vol. III. p. 164.

Colonel Cumberlege, our Consul at Tampico, but his sudden death which occurred soon after, prevented my deriving the information I hoped he would be able to afford. Dr. Seemann however made a fortunate suggestion; he pointed out that according to Dr. Torrey, *Cordia Boissieri* A. De C. is called by the Mexicans *Nacahuita*, a name sufficiently like *Anacahuite* to justify a suspicion of identity. This suspicion has been changed into certainty. In a recent number of *Flora*, occurs the following interesting notice which is republished in *Bonplandia* of 1 November last.

In the summer of 1861, the Botanical Garden of Göttingen received from Mr. Gresser, the Hanoverian Consul at Tampico, two stems of the Anacahuite-tree, which although in a very unpromising condition upon arrival, yet by suitable treatment soon threw out new shoots. They have now grown into strong shrubs, and last winter produced flower-buds, the full development of which was however prevented by the unfavourable season. Mr. Gresser at a subsequent period, sent also dried leaves of the Anacahuite, and the fruit preserved in alcohol, which with the growing specimens, afforded data for determining the plant to be the *Cordia Boissieri* of Alphonse De Candolle, described in the 9th volume of the *Prodromus*, p. 478.

In the herbarium of Sir William J. Hooker of Kew, there are good specimens of *Cordia Boissieri*, from which, with the permission of Sir William, the opposite woodcut has been made.

Touching the properties of the natural order *Cordiaceæ* to which *Cordia* belongs, the remarks of Endlicher* are to the following effect. The pulp of the drupes is mucilaginous, viscid and astringent with some sweetness; in a few it is acidulous; the fleshy cotyledons contain a bland oil. The saccharine fruits of *Cordia Myxa* L., a tree indigenous to tropical Asia, and cultivated in Egypt from a very remote period, were used by the ancients in coughs and other disorders of the respiratory organs on account of their soothing and laxative properties. In Europe they are now very rarely employed. The West Indian *Cordia Sebestena* L. has similar virtues. Of some members of the order the wood and leaves are resinous and aromatic. The brown wood, elegantly veined with black, of *Cordia Rumphii* Bl., has the odour of musk. The bark of *Cordia Myxa* L. is frequently used in astringent gargles in India, and the root is reputed to be laxative.

PHARMACEUTICAL FALLACIES.

"La perfection semble s'éloigner à proportion qu'on fait des efforts pour en approcher."

From the first moment that observation begins to use its power, and memory to fill its storehouse, it becomes clear and distinct to every discriminating mind that wherever truth is to be found, error will certainly be seen walking side by side with it; as surely as night follows day, and darkness, light, fact and fallacy will be found so blended together that the existence of the one without the other would appear almost impossible, and their separation impracticable. It can scarcely be denied that every calling, whether professional, mercantile, or simply industrial, has to a certain extent its fallacies to contend with; the theologian, the senator, the healer of the sick, and the followers of the ordinary avocations, have one and all experienced at some period the influence of certain crotchets or fallacies which from time to time have held a strong opposing position; and though simple, honest truth does in the main generally prevail, still the offsprings of misguided zeal, misplaced talent, and sometimes wilful error, are oftentimes formidable barriers to onward progress.

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* *Enchiridion*, p. 319.

Cordia Boissieri,—*Flowering Branch and Fruit.*

Supposing that so much can be admitted as correct, it will not be matter of surprise that Pharmacy is not singular, but enjoys its fallacies in common with others; and it may not be out of place or uninteresting at the end of the year to bring some of them once more before the falling curtain.

To commence then at an early stage of the journey, namely, education,—a point upon which so much has already been written but still without having percolated the material to exhaustion,—there does not, I believe, now exist in any mind a doubt or even a trace (as analysts sometimes observe) as to the propriety or necessity of a useful as well as liberal form of education, because wherever or in whatever town or district a pharmaceutist carries on his business, it is next to impossible to say what he may be called upon to do or expected to know. In one position dispensing and the simple sale of drugs and chemicals, in another a thorough acquaintance with photographic chemicals, in another analytical experience, in another leeching, poulticing, and some little advice are expected; and in some instances the sale of tea, sugar, and sauces is almost necessary for the realization of a very moderate income.

Now I believe it is a fallacy to suppose that all of these are absolutely necessary to, or compatible with, the business of a pharmaceutical chemist; but it would be equally a fallacy to think that the public would give up the privilege of seeking assistance wherever it was found convenient to do so; some of them may be, and are, with safety, discarded in many situations; nevertheless, however much he may and does regret it, the chemist is often called upon to act a part which, if left entirely to his own wishes, he would always prefer placing in the hands of those properly and better qualified to perform the duty required. Having these points fairly in sight, whilst promoting the facility of the instruction of those who may succeed the present generation in an honourable and useful career, whilst endeavouring to stimulate them in the cultivation of a liberal education and implant in them a thirst for useful scientific knowledge, let it not be forgotten that any of them may be placed where science is little needed, but where good business information is mostly desired. Whilst the completion of the educational career by an attendance upon the lectures, and a course of chemical and pharmaceutical manipulation in the laboratory of the Pharmaceutical Society, is strenuously urged by those who have the teaching of apprentices, let it at the same time be impressed upon them to attack well and earnestly the rudiments, the very simplest of them, in connection with everything pertaining to the various processes as well as all the ordinary routine of business,—even to the skilful handling of a bottle,—by which they are expected at some future day to make their way in the busy world. No man, I believe, ever regretted having learnt too much that was useful in his youth, but how many have sighed at the remembrance of neglected opportunities, and how many in their decline regret that they had not formerly the opportunities now offered to the young!! While thus touching upon the perfecting points of the educational part of the career, let the young be guarded against the fallacy of attaching too much importance to obtaining, as a finishing stroke, a situation in a large dispensing establishment, for, *experientia docet*, such are not always the best schools for acquiring or consolidating general business habits; good and correct dispensing is an absolute requisite, but not the only one. For those especially who may commence in the country, at the seaside, in a crowded city thoroughfare or the outskirts of a large town, or even in the town itself, dispensing from morning till night is calculated to produce a dull salesman, a disinclination for that conversation which is an acquisition in some localities, and an utter distaste, if not contempt, for some of the smaller calls upon the attention.

There is another existing fallacy, very strong and rampant in the present day: I allude to the practice of introducing to the profession, for employment

in *private* practice, substances or preparations which have not been fairly and fully tested in some public institution,—substances of which almost fabulous accounts of their powers are given one day, only to be denied upon another; preparations which are uncertain and unstable; compounds which have no merit but the length of their names and their unpalatableness; preparations which mislead the prescriber, who would, if left to his own judgment, write a much more sensible, elegant, valuable, and profitable prescription, better for his patient and more creditable to himself. The next apparent fallacy which appears, and for which I feel there is some difficulty in devising a remedy, is the giving indiscriminately of copies of prescriptions; this has already been spoken of. Now there can, I feel, be no doubt as to the propriety of giving a copy when the original has been lost or left at home, and the prescriber wishes to see it, but it is an evil which requires much pruning, if not entire eradication, when copies, yea, two or three, are requested; and for what? To give to friends. This is certainly making the most of a guinea investment at the expense of the profession; in some cases, sauce for the goose may be sauce for the gander, but in many instances while the prescriber is deprived of a fee, the patient is made, and perhaps justly so, rather worse than better. It is most difficult, I acknowledge, to find a good cure for this fallacy; a charge for a copy would not effect it, and would involve, in addition to the appearance of ill-nature, a character for covetousness. A firm but polite objection to give more than one copy of any prescription at one time suggests itself perhaps, under existing circumstances, as the best and safest course. Another fallacy equally difficult to be dealt with is the unreasonable lowness of the charge too frequently now made for dispensing prescriptions; judging from information commonly and frequently given, the cost of education, the value of time and personal experience, are put entirely out of consideration, and the bare market value of the articles is calculated. The same price, every one is aware, cannot be obtained in every situation, any more than the same rent. The poor should in all cases be considered; but to charge unreasonably low to persons who can well afford to pay, and who must avail themselves of the assistance of the pharmaceutist and chemist, is a fallacy which cannot be too strongly deprecated; it is the stepping-stone which leads one man to undersell another, and eventually to substitute a bad for a good article in order to realize a living profit. To follow such a fallacy into all its consequences, the depreciation and degradation of talent, is not my intention, it is enough that I have so far attempted to show the folly of it.

The last fallacy connected with pharmacy which I shall mention, is the introduction of methylated spirit; the mischief and detriment which have already fallen upon, and will continue to fall upon, the honest man, are almost incalculable. As *far as the Excise is concerned*, methylated spirit may be used in any preparation required in medicine, conscience and its nauseousness being the barriers to its employment,—conscience, inasmuch as the College of Physicians expressly refused to sanction its use, and its nauseating qualities being greatly opposed to it. That it is nauseous has been fully proved by the fact that certain individuals undertook to clean this methylated spirit, contrary to what was originally supposed to be possible, and contrary to the law, which clearly states that "no person whatever is allowed to rectify or purify methylated spirit for any purpose." That this was always understood by those who did purify it, is palpable from the fact that after having cleaned it, it was not considered safe to send it out as cleaned spirit, but it was virtually smuggled about under false names, such as Sp. Æther. Nit. Dil., and Sp. Ammon. Dil., etc.; and unless the greatest activity be displayed by those whose duty it is to see that the Revenue is not defrauded, methylated spirit will still be purified, so long as money is to be made, by persons not over-scrupulous, and

who, following the mania of the day, desire to make it rapidly, even though it should be done by a crooked, circuitous route. In order to confer a boon upon real manufacturers of chemicals, and others for whom it was intended, it would, I think, have been better and wiser to have allowed the drawback upon pure spirit, and to have held those manufacturers, etc., to whom the privilege of using it was granted, personally responsible for the proper application of it in the arts and manufactures. As circumstances have turned out, it was surely a fallacy on the part of the Government ever to have admitted for its own use any pharmaceutical preparations made with methylated spirit; thereby simply reducing the expenditure of one branch at the expense of another, and with the decided disadvantage of an ineligible production. In thus bringing forward, as well as I am able, some of the fallacies connected with the practice of Pharmacy, I trust that I have urged nothing but facts in support of my statements.

A. F. Haselden.

November 10*th*, 1862.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

On the Detection of Picrotoxin.—Mr. J. W. Langley, in a communication to the 'American Journal of Science,' gives the results of an investigation into the best means of detecting picrotoxin, the active principle of *Cocculus Indicus*, in cases of poisoning, or in beers which have been adulterated with cocculus berries. He points out a peculiarity of behaviour of this principle, which is of importance in separating it from other substances; namely, that while incapable of combining with acids to form salts, it manifests a decided affinity for bases, and deports itself in many respects like a weak acid. Picrotoxin is soluble in 150 parts of cold water, but by the addition of a little caustic alkali it dissolves in 6 or 8 parts. From an alkaline solution of this principle ether is incapable of removing or dissolving anything; but if the solution is rendered neutral or acid, the picrotoxin at once dissolves in the ether, and may be separated with facility. By this means picrotoxin may be readily distinguished and separated from a true alkaloid. If the aqueous solution be strongly acidulated and then agitated with ether, the alkaloid remains combined with the acid, while the picrotoxin passes into the ether.

The following are the specific tests proposed by Mr. Langley. For a reason to be presently stated, it will be seen that they are not as satisfactory as could be wished:—If picrotoxin be dissolved by a little caustic potash, and the solution gently heated, it becomes yellow; and on platinum foil, at a temperature far below ignition, assumes a brick-red colour, which is distinctive, and quite unlike the shade produced by sugar under similar circumstances. If dry picrotoxin and nitrate of potash are rubbed together in a watch-glass, and a drop of sulphuric acid is added, no perceptible change occurs; but if a strong solution of caustic soda or potash is poured upon this, a bright reddish-yellow colour is communicated to the mixture, which partially dissolves, and causes the whole liquid to assume the same tint. In this way very minute traces of picrotoxin may be discovered; so small a quantity as $\frac{1}{5000}$ of a gramme, if pure, being detected with the greatest ease. When as small a quantity as this is used, the colour is most distinctly seen by gently breaking the solid cake of sulphate of potassa which lies on the bottom of the dish; portions of the precipitate will then appear of a crimson or purple hue. In applying this test, it is best to add about three or four times as much nitrate of potash as substance to be examined, and to use no more sulphuric acid than is necessary to moisten the mass. The solution of potash or soda should be made very strong, and enough added to ensure considerable

alkalinity in the mixture after the neutralization of the sulphuric acid. Other powerful oxidizing agents, such as chlorine or chlorate of potash, will produce the same result, but not with equal facility.

Unfortunately for the value of these tests, Mr. Langley goes on to state:—It is extremely probable that this colour is produced from a trace of some nitrogenous body, which pertinaciously adheres to the picrotoxin, as, on analysis, traces of nitrogen can be detected; but this body powerfully resists all attempts at separation, for when repeatedly crystallized the picrotoxin still retains a minute portion of it. It can be obtained perfectly free from nitrogen only by dissolving it in potassa and precipitating it by acids. When thus prepared, its properties are the same as before, with the exception of the purple colour produced by oxidation and subsequent treatment with alkalies.

To examine beer suspected to be adulterated with *Cocculus Indicus*, Mr. Langley acidulates it with hydrochloric acid and agitates with ether; the ethereal solution is then evaporated and tested as described with nitric and sulphuric acid. He states that as small a quantity as $\frac{1}{50}$ of a gramme in a pint of ale can be readily detected by this means.

For cases of poisoning, the author describes the following experiment:—The stomach of a cat which had been poisoned was emptied of its contents, so that only the picrotoxin absorbed by the coats of the stomach might be extracted. It was treated with alcohol, and the solution evaporated to dryness. Acidulated water being poured on the residue, the picrotoxin and a little organic matter were dissolved; being now treated with ether, and the solution evaporated, small crystals of picrotoxin were obtained, which when tested produced the characteristic red colour. A portion of animal matter free from poison, treated in the same way, gave no discoloration.

In examining a liquid for picrotoxin, Mr. Langley directs that it should first be rendered acid, then shaken with ether; the residue left on evaporation of the ether examined with the microscope for small prismatic crystals; if a few drops of sulphuric acid, diluted with its volume of water, are added in the cold, and there are alkaloids present, they will dissolve; only so much picrotoxin passing into solution as is due to the water present, about one part for 150 of water. A few drops of an alkali will dissolve the crystals, and on applying heat the fluid will become first yellow, and when strongly heated brick-red. A small portion of the crystals ground in a watch-glass with nitre of sulphuric acid gives a solution, which, when rendered alkaline by potash or soda, becomes a bright red.

New Process for obtaining Ozone.—M. Schönbein pointed out some time ago that an aqueous solution of permanganate of potash is decomposed by peroxide of barium with the evolution of neutral oxygen. If the permanganate be acidulated with sulphuric acid, the same result occurs; the manganese and the baryta being reduced to sulphates. M. Schönbein accounted for this result by assuming that the oxygen of the permanganic acid is in the state of ozone, while the second atom of oxygen in the peroxide of barium consists of antozone; the union of the ozone with the antozone forms the neutral oxygen.

He now indicates a method for preparing ozone, which consists of a modification of the above reaction. He finds that if instead of making an aqueous solution of permanganate of potash, the salt be dissolved in monohydrated sulphuric acid, a green liquid is obtained, from which, on the addition of peroxide of barium, a gas is disengaged, possessing in a high degree the odour and characteristic properties of ozone.

The process is conducted as follows:—In pure sulphuric acid of sp. gr. 1·85 is dissolved some pure permanganate of potash in fine powder, and in sufficient quantity to form an intensely deep olive-green coloured liquid. This solution is introduced into a flask, arranged so as to admit of the introduction of quantities more or less large of peroxide of barium, while the evolved gas can be at the same time collected by a pneumatic trough over water.

The gas thus obtained is not pure ozone; it is ordinary oxygen, containing a certain proportion of this body. This may be readily shown by agitating the gas with divided silver, or better, with solution of iodide of potassium, the ozonic odour disappears, and with it a certain proportion of the gas; the remainder is ordinary oxygen. Notwithstanding however that the ozone is diluted with a good deal of oxygen, the gas exhibits

the properties of ozone in a high degree. Thus it polarizes negatively a sheet of platinum remaining in it for a few minutes; destroys at ordinary temperatures all organic colouring matters; bleaching almost instantly paper stained with litmus or sulphate of indigo. By its action paper steeped in gallic or pyrogallic acid is turned brown and afterwards bleached; the same result is obtained with hæmatoxylin. Aniline is rapidly oxidized, and bright silver is blackened even at 20° C.; metallic lead is peroxidized, and arsenic quickly transformed into arsenic acid; arsenical stains are consequently readily removed by this agent. Iodine is displaced from its combinations, and the sulphides are oxidized. A crystal of ferrocyanide of potassium is gradually converted into ferridcyanide with the liberation of potash and water; paper impregnated with sulphate of manganese or acetate of lead rapidly becomes brown. Thus, this gas possesses in a high degree all the characters and properties previously described as those of ozone. Introduced into the lungs or respiratory passages, it provokes asthma, mucous inflammation, and catarrh. By heat or contact with powdered charcoal its odour is destroyed. M. Schönbein gives the following specific differences between ozone and antozone:—

1. The action exercised by ozone on sulphate of manganese. Paper impregnated with this salt promptly becomes brown, owing to the formation of MnO_2,—an ozonide which the author represents as $MnO+\dot{O}$. Nothing of the kind occurs in the antozone, which is disengaged by the action of sulphuric acid on peroxide of barium.

2. The action exercised by antozone on binoxide of manganese. Ozone is without action on paper stained with this substance, but antozone decolorizes it, reducing the binoxide to the state of protoxide, especially when the paper is moistened with water slightly acidulated with sulphuric acid. Of course, ozone again colours the paper which antozone has decolorized; and thus the action may be repeated a number of times.

3. The action exercised by antozone on permanganate of potash. A fragment of pumice-stone moistened with a solution of camelion, acidulated with sulphuric acid, preserves its colour in ozone; but is decolorized in antozone (oxygenated water). Of course ozone renders the decolorized compound brown by forming MnO_2.

4. The action of ozone on basic acetate of lead. The same results are obtained in this case as with sulphate of manganese, PbO_2 being formed.

On the Combination of Perchloride of Phosphorus with other Chlorides.—M. Ern. Baudrimont has recently described a very interesting class of compounds, in which pentachloride of phosphorus exists, combined with the metallic and other chlorides, constituting a series of chlorophosphates. Thus compounds of perchloride of phosphorus, with the chlorides of selenium, of iodine, of aluminium, of iron, of tin, of mercury, and of platinum, have been produced. These salts are obtained either by direct union of the two chlorides, or by the action of the pentachloride on the element. They are all solid and volatile, but certain of them are partly decomposed by heat. They fume in the air, and are decomposed by water. Being less volatile then pentachloride of phosphorus, if any excess of the latter be used in their preparation, it may be removed by exposing the substance to a heat of about 160° to 180° C. for some hours, and afterwards subliming. They are purified by repeated sublimations.

Chlorophosphate of selenic chloride (PCl_5,$SeCl_2$).—This substance may be obtained by the direct combination of one equivalent of $SeCl_2$ with one equivalent of PCl_5. It is also formed by the action of an excess of $SeCl_2$ on perchloride of phosphorus, or even on phosphorus itself. This body is of a fine orange-yellow when cold, and of a magnificent crimson-red when hot. It volatilizes at about 223° C.

Chlorophosphate of iodous chloride (PCl_5,ICl) is obtained:—

1st. In causing iodine to react on PCl_5. The following reaction occurs:—

$$3\,PCl_5+2\,I=PCl_3+2\,(PCl_5,ICl).$$

2ndly. By effecting direct combination of PCl_5 with the protochloride of iodine (ICl).

3rdly. By directly combining perchloride of phosphorus (PCl_3) with the perchloride of iodine (ICl_3).

4thly. By causing PCl_3 to react upon ICl_3, chlorine is disengaged.

$$PCl_5+ICl_3=2\,Cl+(PCl_5,ICl).$$

The chlorophosphate of chloride of iodine is solid, crystallizing in needles of a fine orange colour. It is unequalled in causticity, causing perforations in the skin. Water decomposes it; and its solution, containing protochloride of iodine, gives with ammonia a precipitate of iodide of nitrogen. Its vapour has a density of 4·993.

Chlorophosphate of aluminic chloride (PCl_5,Al_2Cl_3).—This body has been already described by M. Weber. It may be prepared by the combination of the two chlorides, or by the action of PCl_5 on aluminium. It is in white flocks or in a slightly brownish mass when it has been fused. It requires a temperature of 400° C. for its volatilization.

Chlorophosphate of ferric chloride (PCl_5,Fe_2Cl_3) was also obtained by M. Weber. It is obtained in the same manner as the aluminium compound. It is of a deep brown, almost black. It fuses at about 98° C., and volatilizes at 280° C.

Chlorophosphate of stannic chloride ($PCl_5,2\,SnCl_2$).—This compound was formerly obtained by M. Casselman by the combination of the two chlorides. It may be easily prepared by the action of an excess of PCl_5 on metallic tin. It is of a brilliant white, crystallizing in fine pearly needles. It volatilizes at about 220° C., undergoing at the same time partial decomposition. Water decomposes and dissolves it, but the solution soon sets into a gelatinous mass of phosphate of tin.

Chlorophosphate of mercuric chloride ($PCl_5,3\,HgCl$).—Perchloride of phosphorus combines directly with mercuric chloride. The same result cannot be obtained with the mercurous compound. The following reaction occurs in the latter case:—

$$7(PCl_5)+6(Hg_2Cl) = 4(PCl_5,3HgCl)+3\,PCl_3.$$

The chlorophosphate of mercuric chloride is in fine pearly white needles. It volatilizes at 200° C. A brisk and more elevated heat decomposes it.

Chlorophosphate of platinic chloride (PCl_5PtCl_2).—This product results from the action of an excess of perchloride of phosphorus upon spongy platinum with the aid of heat.

$$2PCl_5+Pt = (PCl_5,PtCl_2)+PCl_3.$$

After having sublimed the whole mass over, which decomposes a part, the purification should be completed by keeping it in an oil-bath at 220° C. for twenty-four hours. The chlorophosphate of platinic chloride is amorphous, of a ochreous yellow colour. Heated to 300° C. it partially decomposes, but the major part is volatilized without decomposition. This fact is very remarkable, because it is the first instance of a volatile compound of platinum.

ACCIDENTAL POISONING.

(*The Recent Case at North Shields.*)

The proceedings of a recent coroner's inquest at North Shields have caused so much excitement through the North of England, and are of so great interest in reference to the question of accidental poisoning, that it may be worth while to risk the imputation of bringing forward a subject already trite, and to review them briefly, hoping thereby to trace how far they affect the responsibilities of pharmaceutical chemists and other dispensers of medicines. The evidence brought forward at the inquest is exceedingly lengthy, the newspaper reports of it extending to something like a dozen columns, and it would needlessly occupy space to make extracts from it, as an outline of the case may be given in few words.

The name of the deceased was Jane Gilhespie. The inquest was conducted by Stephen Reed, Esq., Coroner. Its various adjourned sittings were held in the Town Hall, North Shields.

It appeared that the deceased had been attended by Dr. Fenwick when suffering from bronchitis, on one or more occasions, before the illness which terminated fatally. For some time previous to her death she had suffered from a severe cold, had obtained medicine for it from a druggist, and not receiving any benefit went again to Dr. Fenwick. Dr. Fenwick noted the case as one of bronchitis with the usual symptoms, and prescribed accordingly. On the 10th of October last, the repetition of a tartar emetic mixture was ordered, and the following morning, shortly after taking the first dose of

it, she was much worse and the doctor was sent for. He came and stayed some time with her, but being obliged to leave to see another patient, sent a message to his partner to take his place at the bedside. Within an hour and a quarter of taking the medicine, the woman died. No symptoms appear to have been noticed by Dr. Fenwick which did not accord with the supposition that death had arisen from bronchitis and congestion of the lungs; but on this point the evidence is contradictory. With a view of confirming his diagnosis, Dr. Fenwick made a *post-mortem* examination of the body, and finding confirmatory evidence in the state of the lungs and bronchial tubes, filled up the usual certificate of the cause of death accordingly. A few days afterwards, suspicion was excited that the medicine was not what it should be, and the husband gave a dose of it to a cat, which dose proved fatal in about ten minutes. A portion of the remainder was poured into a phial and taken to an analytical chemist, who stated that it contained strychnia to the extent of a grain and a quarter to the fluid ounce. On the order of the coroner, the body was exhumed, examined by two medical men, who found congestion of the lungs, etc., as described by Dr. Fenwick, and the viscera placed in the hands of a chemist for analysis. Evidence of the presence of strychnia is said to have been obtained, and was steadfastly sworn to, though the whole quantity taken could not much have exceeded a grain, and considerable time had elapsed—a fortnight, if we recollect rightly—between death and examination of the viscera. Assuming that the medicine contained in the bottle was the same as that sent from the surgery of the medical man, a point which was not combated, some error had evidently been committed in dispensing, and the most rational supposition is, that a solution of strychnia had been taken in mistake for a solution of tartar emetic, and the fact that no antimony was found in the medicine favours this view. The bottles containing the two solutions were standing at no great distance from each other; but it was shown that they were unlike in almost every respect except that they were both labelled "poison," and both contained colourless fluids. The verdict of the jury was:—

"That it is the opinion of the jury that the death of Jane Gilhespie has been caused by strychnia having been administered in medicine supplied to her from the surgery of Dr. Fenwick; but that there is not sufficient evidence before them to decide by whom the medicine was compounded. They are also of opinion that greater caution is requisite in the surgery of Dr. Fenwick, to prevent a similar occurrence in future."

We do not mean to impugn the fairness of the verdict, it is perhaps as lenient as could be expected under the circumstances; but assuming that it is the law of nature that "accidents must happen," we should have liked to have seen greater pains taken in that part of the inquiry which related to the extent of precaution which had been adopted for their prevention. It is the custom in this country for the general practitioner to dispense his own prescriptions: whether this works for well or ill it is not our object at present to inquire, in many cases it is unavoidable, and when such is the practice the responsibilities inseparable from it are assumed. It is seldom that the public have the slightest mercy on the man who is unlucky enough to make an error in dispensing, even though purely accidental; but in a case like the present, where the little evidence that was educed on the point was sufficient to show that precautionary measures for avoiding accidents had been taken, to an extent unusual in surgeries, the amount of censure ought to have been measured in accordance with it. It is indeed difficult to reconcile the latter part of the verdict with the facts elicited. We hear that the drugs of more poisonous character were kept at the back part of the surgery; that a special gaslight had been put up there; that every bottle containing poison had, besides its own label, a large distinct poison label upon it, and so forth: and the general care taken in dispensing is further evidenced by the fact that liniments, lotions, and other medicines for external use, were sent out with conspicuous labels printed on red paper; and further, that every prescription, besides being itself preserved, was carefully copied. We should have thought there was sufficient in this to absolve the jury from the necessity of associating the sort of blame they append to their decision. Possibly an absurd remark of an attorney during the examination of one of the dispensers, who confessed he had not been accustomed to see poisons like tartar emetic, etc., kept always locked up, "Then you have not been in a careful school, I can tell you,"—had much weight in their deliberations. With the real question at issue, the cause of death, and whether it arose from culpable negligence, was mixed up all sorts of matter,

whether relevant or not, which could tend to cast obloquy upon the medical man himself, the intention being, it is no secret, to follow up this inquiry by a civil action. How far a master is liable, after taking all the precautions in his power, for the result of the carelessness of his dispenser, is a question of interest to us, but which we must leave the lawyers to decide.

We confess that we should have been glad to see a different professional animus shown in some parts of the medical evidence. Even though it were proved that the woman died from the administration of strychnia, it was an accident in which moral blame could not be imputed, such an accident as might occur in the surgery of any general practitioner, and we think that greater consideration might have been shown towards a medical brother, placed under such trying circumstances, and that the best, rather than the worst, might have been made of the many doubtful points. This, however, is a matter for the profession itself.

It affects us more directly to consider what are the best means of preventing such a catastrophe in future. The legal opinion, given above, as to locking up all poisonous drugs, is a plan savouring more of the office desk than the dispensing counter, and possesses the disadvantage of being impracticable.

The 'Lancet' assures us in a notice of this case, which appeared a few weeks ago, that the use of Savory and Moore's poison bottles is the one thing needful. But why Savory and Moore's? Why not Mr. Gilbertson's, which are even more striking in their peculiarities? Or why not those of the York Glass Company, which, if we recollect rightly, require a distinct effort of ingenuity to get anything at all out of them? Or why not anybody else's, who chooses to tax the fingers and the patience of dispensers by some still more eccentric form? Or, indeed, why a bottle at all? Why not Mr. Bird's angular corks with the emblems of mortality on the top—the corners to prick your fingers, the skull to grin at you until you are solemn enough to proceed? Or, why not the red labels recommended by Dr. Squire? Why not?—we say; but more than a year ago the Society asked, Why not? and a committee was appointed to furnish in answer. We anxiously await their report.

ESTIMATION OF SUGAR IN BEER.

BY A. VOGEL.

The vegetable parchment, which served Mr. Graham in his beautiful researches on dialysis, has been employed by the author to separate quinine from the non-crystallizable substances which are present in quinquina-bark. Mr. Vogel is of opinion that this material is called upon to render great services in the industry of chemical products.

The parchment paper may be used to estimate the amount of sugar contained in beer, which is tolerably difficult by the ordinary methods. For this reason, a weighed quantity of beer is introduced in the dialyser, and in a few days all the saccharine matter will be found in the external liquid, separated from the gummy principles.—*Répertoire de Chimie, etc.*

LANCASHIRE DISTRESS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you kindly allow me space in the Journal to state that a weekly subscription has been commenced by the associates and students attending the lectures of the Society, for the benefit of the Lancashire Operatives who are suffering so severely from the failure of the cotton supply, and it is proposed to continue it during the winter months.

A committee of five of the present Subscribers have undertaken the management of the Fund so raised, which will be remitted once a month to the Mansion House Relief Committee in London.

For the information of those connected with the Society, either as associates, apprentices, or otherwise, who may feel disposed to assist the Committee in their object,

I beg to mention that a box for contributions has been placed, by the kind permission of the Council, in the hall of the Society's house, and that any sums from sixpence upwards may be forwarded by post, in stamps, or money orders, to the Treasurer, Mr. P. Bond, the Laboratory, 17, Bloomsbury Square, or to me, at the same address, and will, if desired, be duly acknowledged.

I remain, dear Sir, yours respectfully,
M. Carty, *Honorary Secretary.*

ALUMEN EXSICCATUM.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Permit me, through your mediation, to draw the attention of the Pharmacopœia Committee to the article "Alumen Exsiccatum." The instructions of the framers of the last edition of the Pharmacopœia, London, are perfectly clear and precise on the subject. "Alumen" is described as "Aluminæ et Potassæ Sulphas Crystallina." Alumen Exsiccatum will therefore be the same chemical compound deprived of a few atoms of water.

Now it is well known that the Alumen ustum of Commeree, being prepared from the commercial alum (a sulphate of alumina and ammonia), consists almost entirely of sulphate of alumina, and that the great majority of cases have been treated therewith during an unknown period. It might therefore perhaps be advisable that experiments be instituted in order to ascertain whether the sulphate of alumina be the more energetic of the two; and if so, whether it may not be desirable to prescribe its preparation. In any case, I consider the subject worthy of attention. Authority enjoins one article to be used, practice employs another.

I am, yours respectfully,
November 5th, 1862. J. B. Hockin.

MISCELLANEA.

Solution of Albuminate of Iron and Soda.—Sulphate of iron, a hundred and four grains; caustic soda, a hundred and twelve grains; whites of four eggs. Having dissolved the sulphate of iron and the soda, each in a sufficient quantity of distilled water, pour the solutions upon the albumen previously well beaten up; let all now be shaken together and poured upon a filter to separate the hydrated oxide of iron which is thrown down, since all the iron is not in this case converted into albuminate. To the filtered liquid, which now contains, in addition to the albuminate, sulphate of soda formed by the decomposition of sulphate of iron by the soda present in excess, lime-water is to be added to decompose the sulphate of soda, by which an insoluble sulphate of lime is precipitated. To separate the latter, the mixture is to be again filtered; and as the filtered fluid will contain an excess of lime, it is to be subjected to the action of a stream of carbonic acid, care being taken to avoid an excess of the latter, and again filtered to get rid of the insoluble carbonate of lime thus formed. The filtered fluid is now to be allowed to evaporate in a wide shallow vessel until it is reduced to a pint. (A. Fabri.)—*Dublin Med. Press.*

Castor Oil rendered Palatable.—The following easy way of administering castor oil is proposed by the 'Bulletin de Thérapeutique':—Pour the oil over an egg broken into an earthen pan on the fire; when done, add a little salt or sugar, and a few drops of orange-flower water.—*Lancet.*

Suicides by Arsenic.—An inquest was held by Mr. Carttar at the White Hart Tavern, Greenwich, on the body of Mr. George Cowell, aged thirty-six, a dyer in that town. The deceased, it appeared, had been greatly addicted to intemperance, and had suffered from attacks of *delirium tremens*. He was found by the servant vomiting violently, when he remarked, "I have done it now, and have taken enough arsenic to kill a dozen people, and I am going to bed to die." Medical aid was procured, but

the deceased lingered in great agony for four hours, when he died. Mr. Cogan, surgeon, who made the *post-mortem* examination, stated that the deceased must have swallowed between 3000 and 4000 grains of arsenic. The jury returned a verdict "That the deceased committed suicide while labouring under temporary derangement occasioned by intemperance."

On Tuesday, October 7, Mr. John Hargreaves, coroner of Blackburn, held an inquest on the body of Margaret Hunson, who died from the effects of arsenic on the previous day. The deceased, forty years of age, was addicted to drinking to excess; and on the day in question, in a drunken fit, she took from the cupboard a powder which her husband had previously purchased to detroy vermin. She put some of the powder into a cup, and adding some water to it, drank it off, at the same time telling her son that she was having a "fizzing draught." Dr. Garstang was called in, and applied the stomach-pump, but without avail, as she died the following morning. At the inquest Dr. Garstang described the powder as "arsenious acid." The jury returned a verdict of "Temporary insanity."

Poisoning by Nitro-Benzole.—On Friday, November 7th, an inquiry was held at Ramsey, Isle of Man, respecting the death of Mr. Henry Edward Armstrong. It appeared from the evidence that the deceased, who was in the capacity of clerk in the office of the chemical works of Messrs. Gibson and Richards, had, on Thursday, November 6th, taken a few drops, (supposed to have been 15) of nitro-benzole. Immediately after taking it, he felt very unwell, and Dr. Greene, who had been applied to, after applying cold water, administered small doses of ammonia, and also brandy; this gave temporary relief, and the patient became sensible and was able to make a few remarks, but on the following morning a relapse took place, and shortly afterwards he expired. At the request of the jury a *post-mortem* examination of the body was made by Dr. Greene and Mr. Thomas Murray Lean, and the contents of the stomach were transmitted to England for analysis.

Accidental Poisoning by Extract of Aconite.—On Wednesday, November 5th, an inquest was held at Cardiff, before Mr. R. L. Reece, coroner, on the body of Heinrich Kegebein, who had died the previous day from the effects of poison accidentally administered in medicine supplied from the shop of Mr. Franz Carl Reinecke. It appeared that deceased ordered a bottle of sarsaparilla and a box of strong purgative pills from Mr. Albert Reinecke, the chemist's brother and assistant, who prepared the pills, as he thought at the time, with one grain of calomel, one grain of scammony, one grain of extract of wormwood, and one grain of powdered root of marsh-mallows. Deceased took the pills about 11 o'clock on Tuesday morning, complained of illness early in the afternoon, and expired about 4 o'clock. The *post-mortem* examination proved that death resulted from poison, and at the inquest Albert Reinecke confessed that he used extract of aconite instead of extract of wormwood in preparing the medicine. It appeared that the ingredient used for extract of wormwood was taken from a smaller jar contained in the jar labelled "Ext. Absinthii." The coroner, in summing up the evidence, said there was no doubt at all as to the cause of deceased's death, and the jury had to decide what amount of blame, in their opinion, was attached to Albert Reinecke. There was no pretence for saying that the poison was used otherwise than in error, and the only question was whether the carelessness amounted to a crime or was merely censurable. If it were reckless carelessness it might amount to manslaughter, but this did not appear to the coroner to be such a case as that. From the evidence, and from the manner in which Messrs. Reinecke had given their evidence, it rather seemed to be one of those deplorable accidents which might sometimes happen in the case of a well-qualified man. The jury consulted for nearly two hours, and returned a verdict of "Accidental death," accompanied with a censure upon the brothers Reinecke, and a caution as to their future carefulness in preparing medicines. Some dissatisfaction with the verdict having been expressed, Mr. Jones, the stipendary magistrate issued a warrant for the apprehension of the Messrs. Reinecke, the younger brother, (the one who supplied the poison) was not to be found. Accordingly the elder brother, Frank Reinecke, was brought before the magistrates on the charge of slaying and killing, and has been committed for trial, but admitted to bail, himself in £100, and two sureties in £50 each.

Alleged Death from an Over-dose of Medicine.—Dr. Lankester held an inquest on Monday, Oct. 6, in the City Road, on the body of a child, whose death was alleged to have been caused by an overdose of cough mixture, supplied at the Royal Dispensary. It appeared, however, on a *post-mortem* examination that death had been caused by congestion of the brain. The labels on the bottles, it seems, had been written indistinctly in pencil, and a table-spoonful instead of teaspoonful had been given. Verdict accordingly, accompanied by a recommendation to greater care in labelling medicines.

BOOKS RECEIVED.

A Compendium of Domestic Medicine, and Companion to the Medicine Chest. By John Savory, Member of the Society of Apothecaries, London. (Sixth Edition.) London: John Churchill, New Burlington Street. 1862.

Air and Water; their Impurities and Purification. By Henry Bollman Condy. London: John W. Davies, 54, Princes Street, Leicester Square. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co. 1862.

Chemistry. By William Thomas Brande, D.C.L., F.R.S.L., etc., and Alfred Swaine Taylor, M.D., F.R.S., etc. London: John W. Davies, 54, Princes Street, Leicester Square. Edinburgh: Maclachlan and Stewart. Dublin: Fannin and Co. 1863. 8vo, pp. 892. (From the Publisher.)

TO CORRESPONDENTS.

M. G. A. (London).—1. The Pereira medal was not awarded this year, there being no competitors for it. 2. All candidates who, in the opinion of the Board of Examiners, at the Major Examination, pass with honour, are eligible as competitors. 3. The competition in 1863 will take place in August. (See present number of the Journal, page 2 of cover.)

X. (Oxford).—For the regulations of the Council for the Botanical Prizes for 1863, see 'Pharmaceutical Journal,' Vol. III. 2nd ser. pp. 493–94.

An Intending Candidate (Chester).—Babington's 'Manual of British Botany' (Van Voorst, London).

Juvenis (Windsor).—Bentley's 'Manual of Botany' (Churchill, London).

H. C. (Islington).—*Extract of Quassia.* Ten pounds of quassia-wood yields about two and a half ounces of extract; if made with boiling water, double that quantity of extract would be produced.

M. P. S. wishes for the formula for "Saunders's Tooth Powder."

A Poor Assistant.—"Remuneration to Pharmaceutical Assistants in Australia." See Vol. II., 2nd Series, pages 40 and 188.

R. S.—The label forwarded for inspection would not render the article liable to the Stamp Duty.

M. P. S.—The label referred to did not come to hand.

Celsus.—(1) *Cholate of Soda* is probably intended; this, according to Gregory, is formed when a solution of dry bile in absolute alcohol is mixed with ether; the deposit on standing being converted into a mass of crystals. (2) The Club no longer exists.

Mr. F. W. Joy, *Mr. H. C. Moore*, and *Mr. William Herapath* are thanked for their communications.

M. P. S. (Islington).—We do not know how "filtering spoils the clear liquor completely."

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, Elias Bremridge, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. VII.—JANUARY 1st, 1863.

QUALIFICATION THE MEANS TO ADVANCEMENT.

We may congratulate ourselves on the recent adoption of our principles by the United Society of Chemists and Druggists, as set forth in the Manchester manifesto of October last; and although the language used at the various meetings may not be very flattering to Pharmaceutical Chemists, the great fact still remains that a society, established but two years since without reference to education and qualification, is now sending its emissaries through the country to forward those objects as the only basis on which they can hope to build such a structure as shall be deemed worthy of recognition by the Legislature.

If we were careful perhaps to trace this conversion to its cause, we need look no further than the Juries Bill of last session, which made so important a distinction between Pharmaceutial Chemists and Chemists and Druggists; giving to the former what some may deem a more valuable privilege than even the exclusive use of a "fancy title." This was an argument too cogent to be resisted; it has at least convinced the United Society that chemists and druggists have now no legal standing. They ascribe their want of success to the difficulty of defining chemists and druggists, and resolve to obviate that difficulty by naming some qualification on which future legislation may be based; to devise some simple, but effectual, examination; and to establish a board of examiners. Here, indeed, is an imitation of the very machinery already in existence.

We are willing to grant that our organization served us on the Jury question. To pretend that pharmaceutical chemists, or any other men, should be exempt from serving on juries by reason of their superior education, would be to affirm that one of the most weighty matters of the commonwealth might be left in the hands of the ignorant. It is rather that the preponderance of public safety lies in the advantage of having such men always at command for the exercise of their special callings. In obtaining for ourselves this much-prized exemption, we had two classes of objectors to convince. The one said, "We shall have every man who chooses to sell senna and salts demanding freedom from the service." "Not so," we were enabled to reply; "here is a register of pharmaceutical chemists to which no man has been admitted since 1853, or can in future be admitted, without examination." The other met us by the flattering assurance that the withdrawal of our names from the jury list would be a great loss; to this class we had to cite the famous case of Bardell *v.* Pickwick.

While, however, we rejoice in the adoption of our principles by a society which appears to have started on its course with a foregone conclusion against any educational qualification, we must take exception to the opinions ex-

pressed concerning us by those who are now endeavouring to transform that society into a copy of our own.

The Pharmaceutical Society is called by some "a *clique*," and some do it the honour to add, "of the *élite* of the trade;" our views are said to be narrow and exclusive; our terms of subscription too high for the majority of chemists and druggists; our attention too little given to the requirements of trade; our pharmaceutical chemists, such only by virtue of an annual guinea remitted to Bloomsbury Square; our Benevolent Fund, a myth, of which "the less said the better:" and if our corporation really answered to this description, we should be quite inclined to back the crowning assertion, that the Pharmaceutical Society of Great Britain "is on its last legs," and there is a consequent necessity for establishing a new one.

But to all these assertions we are prepared to give an unqualified denial. The chemists and druggists of 1841 were brought together, first, it is true, on a purely trade question—to protest against the restriction which Mr. Hawes's Medical Bill would have imposed on them; but no sooner had they been brought into communication than one or two, more enlightened and large-minded than the rest, set themselves earnestly to work to make permanent the union which was then but temporary. We believe they were men yearning for the advancement of the body to which they belonged; ambitious, if you will; but not using means for their own individual advancement beyond those which advanced their brethren. They wisely determined that the bond of union must be one which *would elevate the members*, to be a power of cohesion from within; that it *must conduce to the public safety*, to be a supporting power from without; and they announced the educational qualification as the foundation of the Pharmaceutical Society. On this basis they could take their stand, and on this plea ask the Legislature for a charter of incorporation, which commences thus:—

"Whereas it hath been represented to us, on the petitions of William Allen, "Charles James Payne, Richard Hotham Pigeon, and others, that they, and "divers other persons, our loving subjects, have associated together, and have "formed themselves into an association, called 'The Pharmaceutical Society of "'Great Britain,' for the purpose of advancing Chemistry and Pharmacy, and "promoting an uniform system of education of those who should practise the "same; and also for the protection of those who carry on the business of Che-"mists and Druggists; and that it is intended also to provide a fund for the "relief of the distressed Members and Associates of the Society, and of their "Widows and Orphans," etc. etc.

The Pharmacy Act commences yet more strongly:—

"Whereas it is expedient for the safety of the public that persons exercis-"ing the business or calling of Pharmaceutical Chemists in Great Britain "should possess a competent practical knowledge of Pharmaceutical and ge-"neral Chemistry, and other branches of useful knowledge," etc. etc.

If this qualification renders the Society a *clique*, then it must remain a *clique*, for the want of it is the only bar to admission, beyond the ordinary requirement of moral respectability. During the first ten years of our existence examination was not compulsory,—certain certificates of fitness were deemed sufficient, and it is with this our opponents twit us when they describe us as Pharmaceutical Chemists by purchase. It can scarcely be necessary to remind them that there must be such a foundation for all voluntary institutions. Certain persons already in position, acknowledging a great necessity, bind themselves together, give their money and their energy to meet it; a date is fixed at which examination must be the test of fitness, the door is open until that time shall arrive; year by year these founders die off, and twenty years hence there will scarcely remain an unexamined Pharmaceutical Che-

mist in the kingdom. There are yet to be found medical men whose titles rest on being in practice prior to 1815.

But for the narrow-mindedness of these founders: was it narrow-minded in men who were by their position debarred from examination to institute an association which should elevate young men, then their apprentices and assistants, to a position at once superior to their own? Was even a period of apprenticeship to a man already in connection required, as is the case at Apothecaries' Hall, and as now proposed by the United Society, or a course of instruction at any particular school prescribed? On the contrary, a standard of knowledge was fixed, moderate enough in the beginning, but advancing as time and education advanced, though now no higher than a diligent student might attain to without devoting his time exclusively to study; and the candidate who could prove his possession of that knowledge, no matter how obtained, was declared qualified to be a pharmaceutical chemist. Certain fees were arranged by the Council under authority of the Act of Parliament; but those fees are by no means excessive. For ten guineas a man may attain the full position. It is true that for future union with the Society an annual subscription of a guinea is required, but this entitles the subscriber to certain privileges which cost little short of that sum, besides placing him in the honourable position of a supporter of the institution which has given him, and seeks to give others, a legal standing in his profession. It gives him, too, an interest and authority in the administration of that Benevolent Fund about which *so little should be said*. We are not anxious to say much, but we may say that the investment is not a mean sum (although we heartily hope to see it increased); and that the Council has never refused, either through necessity or indifference, assistance to one who applied for and was entitled to it.

There is yet one other objection—the apathy of the Council in matters of trade. Matters of trade are various, but we may class them under two heads: the first *private*, affecting us from within; the second *public*, interfering with us from without. Of the first, then, such as early closing, Sunday closing, price lists, and competition, we may at once say we take no cognizance. Each member must and will in such matters exercise his own judgment. It is only by improving our members that we can hope to remove grievances on these heads; and the introduction of the grievances themselves into our deliberations would be but a source of discord. Of the second, or *public* interests of the trade, a very different account must be rendered; and we think we cannot better answer the complaint of our censors than by first directing their attention to the grievance now so bitter in their cup, of the *exclusive legislation* on the Juries Bill. Was that privilege obtained by apathy on the part of the Council? Look at the various attempts to oppress us with a Poison Bill, which would have fettered our daily transactions without increasing the public safety. Was not bill after bill withdrawn in consequence of the strenuous exertions of the Pharmaceutical Society? Has not the examination instituted by us opened a new field for our younger brethren who aspire to the honourable positions in the Army which the authorities at the War Office will only give to men who possess our certificate of qualification? And does not the recognition of the Pharmaceutical Society by various branches of the Government increase year by year?—and not by the Government only, but by the higher branches of the medical profession, who have not scorned to avail themselves of the practical knowledge of Pharmaceutical Chemists in the compilation of a new British Pharmacopœia. We affirm fearlessly, that our position in 1841 and our standing now bear no comparison to each other; and we claim for the Pharmaceutical Society the credit of having rescued Pharmacy in Great Britain from its degradation of

former times. We say then that there exists no necessity for two societies having one object, and we have no fear that two Pharmacy Acts (we mean of course two initiatory Acts) will ever have place in the same statute-book. Still, while assured on this point, we do not profess to be indifferent to the efforts of the United Society; they may, and we hope will, be an incentive to our own fellow-workers to increase their earnestness on behalf of the Pharmaceutical Society; but we think these efforts of our rivals would be more wisely employed on that behalf also; and we freely confess that we see gentlemen beyond our pale whom we should gladly hail as comrades. The basis of our Society is broad enough, and it is not our fault that such men have not availed themselves of its opportunities and advantages. We would recommend our friends to turn to the 'Pharmaceutical Journal,' vol. i. p. 4, and read through a paper on the constitution of the Pharmaceutical Society, by the late Jacob Bell, and cannot do better than add hereto a passage from the same lamented friend in his 'Historical Sketch of the Progress of Pharmacy in Great Britain:'—

"In conclusion, it may be as well to recapitulate the moral which may be drawn from our past history, namely, that political controversies and mercenary disputes are injurious to the interests and character of all parties; that the most effectual method which any class of men can adopt for securing their political rights, and advancing their professional standing, consists not in disputation and warm argument, but in a steady and persevering attention to intellectual improvement, and the establishment of such regulations as are calculated to ensure collective privileges, by increasing the amount of individual merit."

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 3*rd December*, 1862,

Present—Messrs. Bird, Bottle, Davenport, Deane, George Edwards, Hanbury, Haselden, Herring, Hills, Lescher, Meggeson, Morson, Sandford, Savage, and Squire,

Mr. John Clark, Stockton-on-Tees, was elected a Member.

MAJOR EXAMINATION, *December* 17*th*, 1862.

Bray, John	Crediton.
Hardy, Samuel Croft	Birmingham.
Inee, Joseph	London.
Jones, John Edwards	Cardigan.
Stevens, Henry W.	Colchester.
Utley, Alfred	London.

MINOR EXAMINATION.

Bond, Purnell	Bristol.
Gras, Marcel Amédée	Mauritius.
Saer, David Prothero	Pembroke Doek.
Wilson, William	Slough.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Bass, Charles William	Mr. Lovett	Gloucester.
Bucklee, Marmaduke Wm.	Mr. Bucklee	London.
Clampitt, Richard Vooght	Mr. Tanner	Exeter.
Drury, Sydney	Mr. Paine	Canterbury.
Dunkley, Edward	Mr. Jeyes	Northampton.
Fenn, Charles Draper	Messrs. Ferris and Co.	Bristol.
Franklin, Alfred	Mr. Hunt	Winchester.
Nix, John Beard	Mr. Nix	Billericay.
Rollinson, Thomas	Mr. Wilshaw	Pensnett.
Smith, Edward	Mr. Savage	Brighton.
Stebbing, Walter	Mr. Forbes	Reigate.
Starkey, Ebenezer Benjamin	Mr. Humpage	Islington.
Wallis, John Thomas Ward	Mr. Ekin	Grantham.

MINOR EXAMINATION, *Edinburgh, December* 10*th*, 1862.

Bisset, George M.	Edinburgh.
Fuller, Thomas Gilbert	Burntisland.

REGISTERED APPRENTICE.

NAME.	RESIDING WITH.	ADDRESS.
Stewart, Robert	Mr. Stewart	Edinburgh.

International Exhibition.—List of further Subscriptions received in aid of the Committee's expenses :—

	£.	*s.*	*d.*
Condy, H. B., Battersea	2	2	0
Foot, C., & Co., Battersea	1	1	0
Long, Henry, Croydon, 2nd Subscription	1	1	0
Mander, Weaver, & Co.	1	1	0

PHARMACEUTICAL MEETING.

Wednesday, December 3*rd*, 1862.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to the respective donors thereof:—

The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.
The Photographic Journal.
The Technologist.
Répertoire de Chimie.
Pharmaceutisk Tidende. From their respective Editors.
Journal of the Chemical Society.
Journal of the Society of Arts. From the respective Societies.
Report of the Smithsonian Institution for 1860. From the Smithsonian Institution, Washington, United States.

Chemistry, by Drs. Brande and Taylor. From the Authors.

Flowers of *Pyrethrum roseum.*

The same, powdered, constituting what is called "Insect Powder."

Fruits of *Pyrethrum roseum.* From Mr. Daniel Hanbury, on behalf of Mr. John Zacherl, of Tiflis, Georgia.

Specimen of Plate Glass, which has undergone a modification of surface by bending. From Mr. J. N. Maxwell.

Eleven specimens of drugs. From Messrs. M'Culloch and Squire.

Twenty-two specimens of chemicals. From Messrs. Huskisson and Sons.

Eight specimens of drugs and chemicals. From Mr. J. Hulle, Battersea.

Thirteen specimens of drugs. From Messrs. Preston and Sons.

Four specimens of drugs. From Messrs. Morson and Son.

Two specimens of drugs. From Mr. Peter Squire.

Three specimens of chemicals and extracts. From Mr. J. B. Barnes.

Twenty-two specimens of drugs. From Messrs. Horner and Sons.

Fifty specimens of herbs and drugs. From Messrs. Butler and M'Culloch.

Sixty-seven specimens of drugs, chemicals, and preparations. From Messrs. Bell and Co.

Two specimens of chemicals. From Mr. Adolphus Arnold, Guernsey.

Specimens of plasters. From Mr. William Moore, Leicester.

Patent Displacement Apparatus and Patent Glass Taps. From the York Glass Company.

DONATIONS TO THE LABORATORY.

A 2 cwt. cask of magnesite.

Specimens of caustic soda (solid), soda ash (ground), the same (unground), chlorate of potash (crystals), the same (powder). From Messrs. J. C. Gamble and Son, St. Helen's, Lancashire.

The PRESIDENT said that as Mr. Holmes, who was to have read a Paper 'On Rock Oils,' had not arrived, he would advert to the discussion which took place at the last Meeting, at which he was not present. If any member who took part in those proceedings would now make their remarks, he should be happy to reply. As there was no response, the President continued:—Allusion had been made to the preparation called *Linimentum Belladonnæ*, with which his name had been associated, and it might be desirable to give its history and origin. About two years ago, when planting out Belladonna, he had a large quantity of spare roots, for which he had no use but to prepare Atropine. His son suggested that an alcoholic solution of the root would make an excellent external application; accordingly it was mentioned to several physicians, who prescribed it in the place of extract, and not only was it found to be equally effective, but far preferable to the extract in cleanliness. Being thus assured of its advantages, he recommended it as one of the preparations for the British Pharmacopœia, and the Committee adopted it, but made an addition. He however continued to prepare his *without that addition*, and claimed his right to do so.

Mr. VIZER, having now entered the room, handed to the President a bottle of the liniment, bearing the following label:—"Linimentum Belladonnæ; a fluid ounce equal to one ounce of the root. It is ten times stronger than the tincture of the London Pharmacopœia; it is miscible with soap liniment, not miscible with oil."

The PRESIDENT thanked Mr. Vizer for giving him the opportunity of reading the label to the Meeting, and said, "Nothing can be more explicit; here is no secret remedy; from that label any one acquainted with pharmacy can prepare the liniment."

Mr. Vizer regretted that he was not present at the opening of the Meeting, as he intended to have given Mr. Squire the full benefit of the information obtained since the last Meeting. Two bottles of the liniment had been obtained from Mr. Squire's establishment before the Meeting, but since that time an order had been sent to the same establishment for "Liniment. Belladonnæ, Ph. Brit.:" and the preparation he had now produced was sold to his messenger. He (Mr. Vizer) could not understand how Mr. Squire could consider this preparation as his own after it had been adopted by the Pharmacopœia Committee. The question was, how far it was right to sell his own preparation for that of the British Pharmacopœia.

Mr. Squire said, that his assistant receiving the order from a chemist for Lin. Bellad. Ph. Brit., believed that Mr. Squire's liniment was the one required, for neither his assistants nor even his son knew of the addition made by the Committee. His position as President of the Pharmaceutical Society, and its representative in the Pharmacopœia Committee, had compelled him to keep the exact formula secret.

Mr. Vizer said he felt it his duty to put a question to Mr. Hills. Had a preparation called *Linimentum Belladonnæ* at any time or under any circumstances been prepared at his establishment? If Mr. Hills denied it, he should be happy to apologize for having mentioned his name in connection with the subject. He thought the Pharmaceutical Chemists were looked upon as representing the chemists of the day; but he could not imagine what their lamented friend Mr. Jacob Bell would have said to such proceedings.

Mr. Hills said he wished for no apology from Mr. Vizer. He regretted that at the last Meeting he did not know the facts of the case alluded to by Mr. Vizer. He had since learnt that a prescription for *Linimentum Belladonnæ*. Phar. Britt., had been sent to his establishment, and not being acquainted with the preparation, one of the superintendents went to the physician, who willingly gave the formula. Mr. Hills had since learnt from the physician that having found the liniment useful, he had prescribed it, and had inadvertently written "Phar. Britt." With respect to what the late Mr. Bell would have done, he (Mr. Hills) believed that if there had been some slight error on the part of one of the members, Mr. Bell would have gone to that member with a view of correcting the error, without bringing it forward for public discussion. No doubt Mr. Vizer had brought forward the subject on public grounds, but he thought that gentleman might have used more courtesy in expressing his sentiments.*

After some rather desultory conversation, in which Mr. Vizer and Mr. Urwick took part,—

Mr. Deane said, that during the time he had been on the Pharmacopœia Committee, every member had endeavoured to produce the best possible results, without any reference to individual interests. There was no reserve on the part of any one, and therefore he was astonished to find a member of that committee accused of anything so contemptible and mean. He had known Mr. Squire and Mr. Hills for many years, and believed them to be incapable of such an act. It was a misconception throughout. It was well known that it was contrary to the rules of the College for any physician to prepare his own medicines; therefore, if he wanted to try a remedy, he was obliged to go to the chemist. In this case there was no fraud whatever,

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* We have since received a communication from Mr. Vizer, in which he states, "On more calm consideration, I find undoubtedly that Mr. Hills could not have done otherwise, under the circumstances, than he did, namely, sending to the physician by whom the prescription was written, for the formula by which to prepare the liniment ordered."—Ed. Pharm. Journ.

and he thought that as we all "lived in glass houses," it was very imprudent to "throw stones."

Mr. Vizer said that if a physician wanted to try a medicine in a special case, the course alluded to was justifiable; but in this case the liniment was publicly prescribed.

Mr. Bottle had heard with regret the imputation attempted to be cast on Mr. Squire in his absence, at the last Meeting; he then wished it had been said before his face instead of behind his back, but he thought the President had given a very satisfactory explanation. He considered it a credit to the Society, that a preparation emanating from one of their members should be adopted in the Pharmacopœia. No doubt the prescription complained of was an indiscretion on the part of the prescriber, but had it fallen into his hands he should have done as Mr. Hills had done.

Dr. Fraser said, he came to hear a lecture on oil, but had heard a very acid discussion, in which there had been much unjustifiable personality. It was customary for physicians to send their prescriptions to what chemist they pleased, and they had a perfect right to do so. A physician might not be strictly correct in prescribing a remedy the formula for which had not been published, yet the chemist to whom it was sent had no alternative but to prepare it, and no blame could be attached to him for so doing.

Mr. Long said that no physician had a right to write a prescription in such terms before the Pharmacopœia came out.

The Chairman said they were met together as Pharmaceutical Chemists, and that it was not within their province to discuss the duties of physicians.

In the absence of Mr. Holmes, who had promised a communication on the subject of "Rock Oils," but who was unavoidably prevented from attending the meeting, Mr. Sargeant proceeded to offer some remarks on this subject, explaining the sources of these oils on the American continent, and pointing out the applications which have recently been made of the products obtained from American Rock Oil.

In the course of the discussion which took place, it was stated that whilst the crude oil yielded several products by fractional distillation, which were severally applied for lubricating machinery, for burning in lamps, for mixing paints, and even for producing anæsthetic effects, there was no product similar to that obtained from coal tar, that was capable of yielding the splendid dyes which have recently been so fashionable. It was stated, moreover, that the more volatile products which have been used in paints as a substitute for turpentine, have sometimes been found to answer the intended purpose but imperfectly.

Mr. Daniel Hanbury drew the attention of the meeting to a specimen of "Insect Powder," from the International Exhibition, which had been presented to the Museum of the Society, by Mr. Zacherl, of Tiflis, in Georgia. He stated that the effects produced by this powder in destroying the life of insects, although not poisonous to animals generally, was remarkable, as he had himself had opportunities of observing.

Mr. Bland, referring to a communication which appeared in the last number of the 'Pharmaceutical Journal,' on the subject of "Alumen Exsiccatum," wished to inquire whether any member present could inform him where the true potash alum, such as was ordered in the Pharmacopœia, could be obtained. He found, as stated by Mr. Hocken, that commercial alum, at least all he had been able to meet with, contained ammonia in the place of potash.

Mr. D. Hanbury said, that in the Jurors' report for Class 2, Section B, of the International Exhibition, he had stated that most of the samples of Alum exhibited contained ammonia in place of potash, but exceptions to this occurred in the alums from Trieste, and from Tolfa, near Rome.

Professor Redwood remarked that the alum slate at Whitby, from which the commercial alum of this country had been largely made, contained a portion of potash, which, to the extent to which it was present, would enter into the composition of the alum produced from that source; and the deficiency of potash in the mineral was formerly made up by the addition of a salt of potash during the manufacture, but now it appeared that ammonia was substituted in consequence of its being cheaper.

PHARMACEUTICAL SOCIETY, EDINBURGH.

The members of this Society held their Second Meeting for the present Session, in the new saloon, George Street, on Wednesday evening, 17th December. There was a good attendance. Mr. Aitken, President, in the chair.

The first communication was by Dr. Stevenson Macadam, F.R.S.E., "On Liquid Diffusion, and its Applicability for the Analytical Separation of Substances." It was stated that the process of liquid diffusion enabled the chemist to separate substances from each other with great facility and by very simple means. The present Master of the Mint had worked long and laboriously at this department of scientific inquiry; and, indeed, his researches had supplied all the known facts and deductions therefrom. Liquid diffusion had been discovered at the same epoch as spectrum analysis, and both were great auxiliaries to the ordinary modes of investigation; for, whilst spectrum analysis supplied a means of detecting and recognizing the minutest traces of the various elements in a complex substance, liquid diffusion gave the power of successfully separating the ingredients from each other. Dr. Macadam explained the various forms of apparatus which could be employed in liquid diffusion, and experimentally exhibited their mode of operating. He then made allusion to the importance of this branch of science in physiological inquiries, and to the great influence which liquid diffusion must exert in the absorption of food elements by the animal system. The science of geology also was likely to be enriched by the explanation given of the separation and crystallization of mineral substances; and the importance of liquid diffusion in the detection of poisonous substances, and in the extraction of active principles from crude materials by the pharmaceutist, could not be over-estimated.

After some discussion on the value and probable use to which this new system of Dialysis may be put, a vote of thanks was unanimously accorded to Dr. Macadam for his interesting and instructive communication.

Mr. Mackay presented to the meeting specimens of the flowers and seeds of the *Pyrethrum roseum*, which had been shown in the Austrian section of the International Exhibition by M. Zacherl, of Tiflis, in Georgia, where they had been grown. The specimens were interesting in consequence of representing the well-known insect destroyer, which is simply the flowers of the plant reduced to powder. They were presented to the Museum of the Society by Mr. Hanbury, of London, on behalf of M. Zacherl, to whom a vote of thanks was accorded.

The meeting thereafter adjourned.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fourth Ordinary Meeting of the Session was held at the Royal Institution, on Thursday, November 20th; the President, J. Shaw, Esq., in the chair.

Dr. P. Pauli was elected a member.

The Secretary announced the following donations :—To the library : the 'Chemist and Druggist,' from the Proprietors ; and the Proceedings of the Literary and Philosophical Society of Liverpool, from the Society. To the museum : Specimens of Jamaica Ginger and Cayenne Pods, from Messrs. Higgins and Cattle ; and a specimen of Galanga Root, from Messrs. Holt and Banner.

The exhibition of a plan for preventing the escape of the vapour of petroleum was postponed, as the author, Mr. F. D. Delf, intended taking a patent for it, and therefore wished not to show it until the patent was properly secured.

A short discussion ensued respecting the deodorization of petroleum.

Mr. Thomas Sherlock then read the Paper of the evening, "On the Action of Mordants and the Fixing of Colours."

A vote of thanks to Mr. Sherlock and to the donors to the library and museum closed the proceedings.

The Fifth Meeting of the Session was held on Thursday evening, December 4th ; the Vice-President, Mr. A. Redford, in the chair.

Mr. J. C. Hewitt was elected a member.

The following donations were announced :—The 'Technologist' for December, from the editor ; and an interesting series of specimens illustrating the manufacture of Aluminum, from Messrs. Bell Brothers, of Newcastle-on-Tyne.

Mr. King made some remarks respecting the use of Irish Bog Iron ore for the purification of coal gas. Mr. King also presented to the museum specimens of the ore, and several samples of native sulphur.

Mr. Abraham begged to correct an error in the report sent to the 'Pharmaceutical Journal,' p. 262, of what he had said at a recent meeting respecting the means of preventing explosions of petroleum vapour. The first sentence was correct. What he further said related to the means of keeping large vessels of petroleum or its products *full*, whilst providing for the expansion and contraction of the fluid, which he said might be effected by making a communication through a tube with a vessel of water ; and he also suggested that the petroleum tanks should be emptied by forcing water into them, thus keeping them always full. He had been told that his suggestion had been made the subject of a patent.

A Paper on "The Compounds of Ammonia" was read by Mr. Martin Murphy, who illustrated his subject by numerous drawings and experiments. At the conclusion of the Paper a short discussion ensued upon some of the points mentioned.

A vote of thanks was passed to Mr. Murphy for his Paper.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., ETC.

(*Continued from p.* 269.)

VII. SARRACENIA PURPUREA, *LINN.*—INDIAN CUP, SIDE-SADDLE FLOWER.

History.—This plant is at the present time exciting the interest of the medical profession in this country and elsewhere, on account of its reputed value as a remedy for small-pox. The first authentic notice which appeared in England of its use for such a purpose, was in a paper entitled "On an Indian Remedy for Small-pox," communicated by Mr. Herbert Miles to the Epidemiological Society, and which was read at a meeting of that society, on November 4th, 1861.* It was stated by Mr. Miles, in that communication,

* See 'Lancet' for December 7th, 1861 ; 'Medical Times and Gazette,' vol. ii. for 1861, p. 513 ; and 'Pharmaceutical Journal,' 2nd ser. vol. iii. p. 323.

that whilst stationed at Halifax, Nova Scotia, as an Assistant Surgeon to the Royal Artillery, a terrible epidemic of small-pox broke out, which was especially virulent amongst the Indians and coloured people generally, from, he concluded, such persons being unvaccinated. Whilst this terrible scourge was committing its ravages, he states that a squaw of the Mic-Mac tribe of Indians went amongst those attacked, and administered to each of them a strong infusion of an unknown root, which treatment was so successful as to cure every case. Mr. Miles afterwards succeeded in obtaining specimens of the plant from which this root, thus used for small-pox, had been obtained, which, upon examination, was found to be the *Sarracenia purpurea*.

The next published statement of this reputed anti-varioloid remedy which appeared in this country, was in a letter by Dr. F. W. Morris, of Halifax, to the 'American Medical Times' of May 24th, 1862, and which was reprinted in the 'Pharmaceutical Journal.'* Dr. Morris here claims to have been the first medical man who had put this remedy upon its trial in the treatment of small-pox. The secret, he states, was obtained by him from a Mr. Lane, late of her Majesty's Imperial Customs of Nova Scotia, who had derived it from the Mic-Mac Indians. In this communication Dr. Morris speaks in the most extravagant terms of the value of *Sarracenia* in small-pox. Since Dr. Morris's letter, various notices have appeared in the 'Lancet,'† from Mr. Miles and Dr. Morris, each of whom claims the merit of having been the first to use and make known the remedy to the medical profession. Into this controversy we cannot enter; but as noticed above, Mr. Miles's communication was the first published statement which appeared in the journals of this country upon this reputed remedy.

According to Mr. Miles, this supposed remedy "has been long partially known to some of the North American Indians; but only a few in a single tribe possessed any clue as to the nature of the herb whence the root was obtained."‡ It is also stated by Mr. Miles to have been known, although imperfectly, for some years, to the Eclectic practitioners. Whether this reputed remedy possesses any power of preventing, alleviating, or curing the terrible disease for which it has been introduced to the medical profession, will soon be made known, as it is now being tried at the Small-Pox Hospital, and by numerous practitioners in various parts of the country.§

Whilst noticing the history of the *Sarracenia* as a remedial agent, it is right to mention, that two other species of this genus of plants, *S. variolaris* and *S. flava*, were brought into notice by Dr. Porcher, as far back as 1847, in a communication published by him in the 'Charleston Medical Journal and Review.'‖ From this communication we learn that the inhabitants of South Carolina had long employed the roots of these plants as a domestic remedy. They were believed to be wonderfully efficacious in the treatment of dyspepsia; and of great service in sick headache, waterbrash, gastralgia, abdominal distension, etc. Dr. Porcher, in trying the remedy upon himself, found that it was a stimulant to the stomach, the circulation, and to some extent to the brain, and also at the same time in some degree diuretic and mildly purgative.

Synonyms.—This plant is the *Sarracenia purpurea*, Linn. Spec. 728; Reich. ii. 577; Willd. ii. 1150; Bot. Mag. t. 849; Hook. Fl. Bor. Amer.

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* Pharm. Journ. vol. iv. p. 87.

† See 'Lancet' for August 23rd and 30th, October 18th, and December 3rd and 13th of last year.

‡ 'Lancet,' Oct. 18, 1862, p. 430.

§ Since the above was in type, Sarracenia has been employed at St. George's Hospital without the slightest effect upon the disease. See 'Medical Times' for December 20, p. 664.

‖ Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1483.

vol. i. p. 33; Torr. and Gray's Fl. North Amer. vol. i. p. 59; and of Gray's Gen. Fl. Am. Bor. Orient. vol. i. p. 108, with good plates. It is the *Sarracenia canadensis*, Tourn., and the *Sarracenia heterophylla*, Eaton, Man. Bot. Other names have also been given to it at various times by different botanists; but it is now generally known as the *Sarracenia purpurea*. In common language it has been called, Purple Side-saddle flower, Fly-trap, Indian Cup, Huntsman Cup, Frog's Leggings, Huntsman Cap, Indian Pitcher-plant, etc.

Etymology.—The generic name of *Sarracenia* was given to it by Tournefort in honour of Dr. Sarrazin, of Quebec, Regius Professor of Anatomy and Botany, who first sent this plant to him. The specific name, *purpurea*, is derived from the colour of its flowers. The origin of the common name, Side-saddle flower, is not very evident; according to Miller,* the English who first settled in North America, gave this plant the name of Side-saddle, from the resemblance of its stigma to a woman's pillion. Lindley† says this name was derived from the singular tubular leaves which it and its allies present. The popular names of Indian Cup, Huntsman Cup, Indian Pitcher-plant, etc., are evidently derived from its peculiar tubular, somewhat cup-like or pitcher-shaped leaves. The name of Fly-trap was given to it from its supposed power of attracting flies, etc., into the tubular cavities of its leaves, and afterwards preventing or offering impediments to their escape. The name of Huntsman Cap arose from the supposed resemblance of the appendage terminating the tubular portion of the leaves to an Indian squaw's cap.

Botany.—The genus *Sarracenia* was placed by Necker in his *Catizophyta;* by Jussieu in his *Dubii Ordines;* by Cassel in the *Papaveraceæ;* and by De la Pylaie in the Natural Order *Sarraceniaceæ*, in which Order, following him, it is now commonly put by botanists, and of which it is regarded as the type.‡

Generic Character.—*Calyx* of 5 sepals, surrounded by a small involucre of 3 bracts. *Corolla* of 5 petals. *Stamens* numerous, hypogynous. *Ovary* 5-celled; *style* single; *stigma* persistent, petaloid, peltate, with 5 projecting angles.§

Specific Character.—Herbaceous perennial, growing in marshy or boggy situations. *Roots* fibrous. *Leaves*, of which there are generally about six, or sometimes more, springing from a rhizome, from six to nine inches long, ascending, arcuate, petiolate below, and afterwards forming a hollow, tubular, somewhat horn-shaped cavity, with a very broad arched wing externally, and terminated above by a broad, erect, cordate lamina, the inside of which is lined by retrorse hairs.‖ *Stipules* ovate, mucronate. *Scape* 1–2 feet high, round, smooth, 1-flowered. *Flower* large, nodding, purplish-red. *Petals* bent over the stigma.¶ The leaves vary in colour, according to their age; thus in the spring they are bright green, they then gradually become of a purplish hue, and ultimately towards autumn change to dark brown.

Habitat.—*Sarracenia purpurea* is a native of Canada and the States of North America, where it has an extensive range, spreading from Florida to Newfoundland. It is most common in the Northern States, and is not found west of the Alleghanies. It is only found in North America. It flowers in May and June. From the singular appearance of its leaves, etc., it may be

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* Miller's 'Gardener's Dictionary,' article Sarracenia.

† 'Vegetable Kingdom,' Sarraceniaceæ, p. 429.

‡ For the characters of this Order see Bentley's 'Manual of Botany,' p. 446; or any work on Systematic Botany.

§ Torrey and Gray's 'Flora of North America,' vol. i. p. 58.

‖ See figure 45 in Gray's 'Genera of the Plants of the United States,' vol. i.; and fig. 368, p. 183, in Bentley's 'Manual of Botany.'

¶ Torrey and Gray, l. c. vol. i. p. 59; and Gray's 'Genera,' vol. i. pp. 105–108.

frequently seen under cultivation in the botanical and other gardens of this country and elsewhere.

Collection, etc.—When required for medicinal purposes the time of collection should vary, according to the part required. Thus, the rhizome should be obtained late in the autumn after the leaves have withered, or early in spring before active vegetation has commenced; and the leaves about the month of May, or just before the flowering takes place. At present, however, we know nothing of a certain character as to the comparative medicinal virtues of the leaves and rhizomes, or indeed, nothing positive as to whether either possesses any value as a remedial agent. Some give the preference to the rhizome, others to the leaves. This conflicting testimony is probably due to the different periods at which they have been respectively collected; one being most active at one season, and the other at another. It would seem probable that any portion of the plant which has a decided bitter flavour, possesses the active properties of the plant; and that its activity is in direct proportion to its bitterness (see p. 300). At the present time it is common to collect the rhizome and leaves together, which is evidently a mistake, and one that may readily be guarded against if this remedy should turn out to be of any value in the disease for which it has been especially recommended.

General Characteristics.—At present the *rhizomes*, or *roots* as they are improperly termed, of the *Sarracenia purpurea*, are either sold by themselves, the leaves and rootlets having been almost entirely removed; or the leaves, rhizomes, and rootlets are mixed together in varying proportions, the greater proportion generally consisting of the sliced leaves.

The *rhizomes*, as sold separately, vary from two to seven or even more inches in length; and in thickness usually from about a line to nearly half an inch, the average thickness being about two and a half lines. At one extremity of the rhizome we frequently find the remains of the leaves, which are partially infolded and overlap each other. Portions of the leaves and rootlets are also scattered over the rhizome at varying intervals, but nearly the whole of these parts have been removed. The rhizomes have a somewhat cylindrical outline; they are more or less twisted and knotted, and have a very irregular surface, which is principally caused by the projecting scars left by the fallen leaves. These scars occur at varying intervals upon the rhizome, being sometimes close together, and at other times separated by intervening spaces of two or more inches in length: they form projecting ridges of a somewhat horse-shoe, irregularly convex, or annular shape, which encircle the rhizome for about two-thirds of its circumference. Between these scars there are irregular longitudinal furrows. The rhizomes have a close irregular fracture.

The *rootlets*, which are but very few in number, as already noticed above, are very small, and fibrous in appearance. They are commonly from about a quarter, to an inch or more, in length.

Upon the surface of the rhizome where the rootlets have been removed, little roundish whitish spots may be noticed. The external surface of both the rhizomes and rootlets has a reddish-yellow-brown colour usually, although we sometimes find pieces of rhizome of a dark brown or brownish-black colour, intermixed with the ordinary-coloured rhizomes. The dark colour of these rhizomes is probably due to damp, arising from imperfect desiccation and other causes.

A transverse section of the rhizome exhibits a large central spongy medullary portion, of a whitish, very slight pink hue, surrounded by a more or less interrupted zone of fibro-vascular or woody bundles, and on the outside of which is another zone of whitish cellular matter resembling the central portion.

Neither the rhizome nor rootlets can be said to have any very perceptible odour in a dried state, except when moistened, when they have a faint and peculiar one. Their taste is bitter and very slightly astringent.

The *rhizomes*, as found in commerce *mixed* with the leaves, etc., are commonly from about an inch to three or four inches in length; and from about a line to half an inch or more in thickness. They are generally terminated at one extremity by a tuft of the persistent bases of the leaves. These bases, which are flattened, embrace each other, as well as the rhizomes to which they are attached, for some extent, and terminate above in roundish or angular solid spongy petioles of a quarter of an inch or more in length. The outer surface of the rhizomes presents a very irregular appearance, from being almost entirely covered by the remains of leaves and rootlets of varying length; hence the scars and furrows spoken of as being observable in the rhizomes sold by themselves, and from which the leaves have been removed, are only evident at certain spaces in the present specimens. They have a reddish or yellowish-brown colour externally, and the persistent bases of the leaves are frequently somewhat pinkish. Their fracture is close and irregular. In the characters presented by a transverse section, and in their odour and taste they are analogous to the rhizomes already described. The *rootlets* also resemble those previously described in colour and general appearance; they are, however, far more numerous, and of greater length in the present specimens.

The *leaves* which are mixed with these rhizomes are more or less broken up, and consists of slices of the pitchers, laminæ, and lower portions of the petioles. The slices of the pitchers and laminæ have a greenish, brownish, or pinkish colour externally, and are traversed by reddish or pinkish veins, which are branched in the laminæ. These differences of colour depend chiefly upon the time of year at which the leaves have been collected, and the mode of drying. The external and internal surfaces of these dried slices are nearly smooth, except the under surface of the laminæ, which are covered by stiff, bristly, retrorse hairs.

The slices of the lower portions of the petioles are solid, cylindrical or angular in outline, and frequently terminated above by hollow tubular cavities, which are the lower ends of the pitchers. All portions of the leaves have a peculiar odour, and when chewed they have but little taste at first, but after a short time they are bitter and somewhat disagreeable.

Composition and Chemical Characteristics.—No complete chemical analysis of the rhizomes or leaves has as yet, so far as we know, appeared. The rhizome of an allied species of Sarracenia was however analysed some years since, by Professor Sheppard, of the United States, who found it to contain *lignin, colouring matter, resin,* an *acid salt of lime,* and a *salt probably of an organic alkali.** It is most probable that the composition of the *Sarracenia purpurea* rhizomes will not differ essentially from this; indeed, Mr. Miles says,† quoting Dr. King, of Cincinnati, that their composition is as given above for that of the allied species; but we suspect that some confusion has arisen as to the exact species which was chemically examined as regards the rhizomes. It is very desirable that some chemist should carefully examine the rhizomes and leaves of the *Sarracenia purpurea,* and especially with reference to the supposed new salt of the organic alkali just alluded to.

An infusion of the bruised rhizomes as sold separately without the leaves and rootlets, in the proportion of one ounce to twenty-four ounces of boiling

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* Wood's 'American Quarterly Retrospect,' ii. 78; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1483.

† 'Lancet,' Oct. 18, 1862, p. 430.

water, and allowed to macerate for twenty-four hours, had a yellowish-brown colour, a faint, peculiar, very slightly aromatic odour, and a bitter, slightly astringent, and not altogether agreeable taste. It exhibited also the following reactions :—*Blue litmus paper* was reddened ; *tincture of iodine* caused a deep blue coloration, and ultimately a precipitate; the *solutions of perchloride* and *persulphate of iron* produced a brownish coloration and precipitate ; *solution of nitrate of baryta* lessened its colour ; the *solutions of acetate* and *basic acetate* of lead rendered the infusion opaline in appearance and then caused precipitates ; *solution of nitrate of silver* produced after a short time a brownish-yellow precipitate ; *solution of oxalate of ammonia* had no perceptible effect at first, but it soon made the infusion cloudy, and ultimately a slight whitish precipitate was formed ; *solution of chloride of lime* heightened the colour at first, then nearly discharged it, and caused ultimately a whitish floating precipitate ; *the solutions of ferrocyanide of potassium, chromate of potash, antimoniate of potash, sulphate of copper, bichloride of platinum, chloride of calcium, sulphate of lime, protochloride of tin, potassio-tartrate of antimony, ammonia,* and *infusion of galls,* had no very evident effects upon the infusion. Neither was any effect, except a slight lessening of the colour, produced by the addition of either *nitric, sulphuric,* or *hydrochloric* acids.

An infusion of the bruised rhizomes, picked out of a mixed specimen of Sarracenia leaves and rhizomes, made of the same strength as the infusion just described, and in every respect similar to it, presented almost identically the same general and chemical characteristics, but it appeared somewhat more powerful.

By applying *sulphuric acid* to a section of this latter rhizome, the distinction between the three layers already noticed (see p. 297) was rendered more evident, from the darkening of the woody zone, and the whole surface assuming a pinkish hue. When *nitric acid* was added, the distinction between the layers was also rendered more evident, and the whole surface of the section, and more especially the woody zone, became red. *Hydrochloric acid* applied, produced at first a slight yellowish tint on the surface, but ultimately the whole portion, and more especially the woody zone, became pinkish. *Solution of ammonia* added to the surface gave a yellowish colour to it.

The effects produced by adding *sulphuric, nitric,* and *hydrochloric acids,* and *solution of ammonia,* to a section of the rhizome first described, were in most respects the same, but they were not so evident as in the latter rhizomes.

The chemical and physical characteristics of the two rhizomes thus described above, clearly indicate that they have the same or a very closely allied origin.

An infusion of the sliced leaves picked from a mixed specimen was then made of a like strength to the two former. This presented the same appearance as they as to colour, except that it was somewhat darker and more golden. Its taste and odour were nearly the same. By the application of the reagents mentioned above, the only marked differences observable were, that no effect was produced by tincture of iodine, less effect was caused by the acetates of lead, more effect by solutions of nitrate of silver and oxalate of ammonia ; and that nitric, sulphuric, and hydrochloric acids all communicated a reddish tinge, whereas they lessened the colour when added to the preceding infusions.

When *nitric acid* was applied to a section of the lower portion of the petiole, it produces a reddish tint ; *hydrochloric acid,* under like circumstances, caused a pinkish hue; *sulphuric acid* similarly applied had no evident effect.

Comparative Medicinal Value of the Rhizomes and Leaves.—Upon this point the evidence is at present very conflicting. Mr. Miles* says, "The Indian authority for its use asseverates, with peculiar emphasis, that the root (rhizome) alone is efficacious in small-pox; and that preparations of the leaves are *useless* in *that* disease." This is strong testimony as to the superior value of the rhizome. Dr. Morris, however, who has gained his experience in the same district as Mr. Miles, states :† "The most obvious and unmistakable feature of the Sarracenia as to taste is its decidedly 'willow flavour,' so like the salicin that any one would take its infusion for that of the alkaloid named. Whatever part of the Sarracenia imparts to the tongue this willow flavour may be relied upon as the cure for variola. The roots, young or old, all exhibit this flavour, as also the rootlets, rhizoma, and radicles, and even the loosest flocculi of the epidermis that so easily separate from the plant by friction. I have used them all in my cases with equal success." Mr. Miles also states that the Indians "repeatedly asserted that the *fresh* root was not so powerful as the *dried*."‡ Comparative experiments are therefore still required before we can come to any positive conclusions upon the relative medicinal value of the rhizomes and leaves. So far as I have been able to examine these respective parts, both chemically and physically, I should say that if the Sarracenia possesses the virtues ascribed to it as a remedy in small-pox, both rhizomes and leaves will be found almost equally efficacious, but I should be inclined to give a slight preference to the rhizomes. The efficiency of both, however, will greatly depend upon the periods in which they are respectively collected, as already noticed.§

From some experiments made by Mr. Tichborne upon himself,‖ he came to the conclusion that there was no essential difference in the action of the rhizomes and leaves upon the kidneys, and he accordingly recommends their employment indifferently. A French writer¶ thinks, that the therapeutic property of the plant is due to the viscous secretion which is exuded from the internal surface of the pitchers; and that under any circumstances, this substance ought to be subjected to analysis.

Medicinal Properties and Uses.—From information gathered by Mr. Miles from the Indians, he ascertained that Sarracenia was considered not only a certain cure for small-pox, but also very valuable as a preventive of that disease. It was customary, he says, when the people were exposed to infection, for them to keep a weak infusion of the root prepared, and take a dose occasionally during the day, so as to "keep the antidote in the blood."** Mr. Miles gives no particulars of cases treated by him, but he states, that the effect of the remedy when tried by Dr. Richardson, of Toronto, upon a white person attacked with small-pox, was "most satisfactory and well marked."†† Dr. Morris, who appears to have tried it extensively‡‡ in practice, states "that it is the remedy for small-pox in all its forms, in twelve hours after the patient has taken the medicine. It is also as curious as it is wonderful that, however alarming and numerous the eruptions, or confluent or frightful they may be, the peculiar action of the medicine is such that very seldom is a scar left to tell the story of the disease." Again he says, "I have

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* 'Lancet' for Oct. 18, 1862, p. 430.
† 'Lancet,' Dec. 6, 1862, pp. 638–9.
‡ 'Lancet,' Oct. 18, 1862, p. 436.
§ See collection of Sarracenia, p. 279 of the present number.
‖ 'Dublin Medical Press.'
¶ 'Répertoire de Pharmacie,' July, 1862.
** 'Lancet,' Oct. 18, 1861, p. 431, and 'Medical Times and Gazette,' Nov. 23, 1861, p. 543.
†† 'Lancet,' as above.
‡‡ Pharm. Journ. vol. iv. p. 87; and 'Lancet' for Dec. 6, 1862, p. 638.

no hesitation in pronouncing *Sarracenia purpurea* to be the remedy for variola, varicella, rubeola, lepra, psora. I have used it with unqualified success in these cases. It not only *relieves*, but it *extinguishes*, and what is more, in any given instance it is sure to emancipate from subsequent abnormal developments, as a general rule. In psora, lepra, and skin disease, I have little or no trouble, and I find a liberal use of the chloride of calcium a very decided auxiliary and quickener of the sarracenic virtues in skin treatment." He adds, "It would be just as well to mention here that any person carrying with him the root of the Sarracenia may chew his path with perfect impunity through small-pox, wherever it may stand in his path. I sincerely hope it may be so with plague, Asiatic cholera, or any other scourge." The only functional influence it appears to have, is in promoting the flow of urine. We can only hope that the extraordinary virtues attributed by Dr. Morris to this remedy may prove true, for if so, the Sarracenia would be indeed, one of if not the most important remedial agent we possess. We regret to hear however, in several directions, that hitherto when tried in this country and elsewhere, except in the cases previously noticed, Sarracenia has altogether failed to cure, or in any way modify, the progress of small-pox. Some published statements to this effect have been already published in the journals; thus it appears* that "at a recent meeting of the Medical Society of Nova Scotia, held at Halifax, the subject was discussed, and a resolution passed to the effect that there were not "any reliable data upon which to ground any opinion in favour of its value as a remedial agent." Letters to the same effect have also appeared in the 'Lancet,' etc.† Amidst such conflicting statements we can come to no definite conclusions as to the value of Sarracenia in small-pox, neither is it within our province; we can only wait anxiously for the reports of those gentlemen who are now giving it an extended trial in public and private practice, and who are competent to pronounce an opinion upon its merits.

Administration, Preparations, and Doses.—Sarracenia has been administered in powder, and in the form of infusion, decoction, and tincture. There are no recognized formulæ for any preparations. Dr. Morris states‡ that "the dose of the medicine—the powdered root—is about a dessert-spoonful, simmered in a pint of water down to half a pint; this is divided into two doses, one taken immediately, the other in six hours; no sugar should be given with it." Subsequently, in the 'Lancet,'§ from having afterwards found that all portions of the plant possessing the bitter flavour had similar virtues, as we have already noticed,|| he recommends the following formula; at least, the formula is constructed from data given by him:—

Decoction of Sarracenia.—Take of Sarracenia *one drachm*, boiling water *one pint;* reduce to half a pint by moderate ebullition, and strain. Dose, a wineglassful every three hours. The dose here recommended is much less than Dr. Morris at first employed, as just noticed. Any portions of the Sarracenia which possess a bitter flavour may be used, that is, either rhizomes or leaves, or a mixture of the two.

We subjoin the following formula for—

Infusion of Sarracenia.—Take of Sarracenia rhizomes or leaves, half an ounce; boiling water, *one pint.* Macerate for four hours, and strain. Dose, from one to two fluid ounces.

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* Pharm. Journ. 2nd ser. vol. iv. p. 234, from British Amer. Journ.
† 'Lancet' for Nov. 29, 1862, p. 604, and 'Medical Times,' Dec. 20, 1862.
‡ Pharm. Journ. vol. iv. 2nd ser. p. 88.
§ See 'Lancet' for Dec. 6, 1862, p. 638.
|| See page 300 of the present number.

The following formula for a tincture or liquor has been given by Mr. Tichborne :*—

Tincture of Sarracenia.—"Take of Sarracenia rhizomes or leaves, *five ounces;* water, a sufficient quantity; rectified spirits of wine, *two and a half* fluid ounces; coarsely powder the Sarracenia, and pass it through a sieve the meshes of which are about one hundred and sixty to the square inch; moisten it with a little water, and pack lightly into a displacement apparatus, allowing water to percolate through as long as any amount of extractive matter is withdrawn; evaporate this upon a water-bath to about fifteen ounces; add the spirit when cold, and sufficient water to make the whole measure one pint. The dose of this tincture or liquor will be from ʒss to ʒvi, copiously diluted with water." This formula, Mr. Tichborne informs us, was constructed under the idea that the average dose of Sarracenia would be about ʒi ss; hence each fluid ʒss represents ʒi of the Sarracenia. This dose of Sarracenia, according to Dr. Morris, is too large.† The dose, to accord with those given above of the decoction and infusion, would be from ʒi to ʒi ss.

ON THE PRESENCE OF ARSENIC AND THALLIUM IN THE MEDICINAL PREPARATIONS OF BISMUTH, AND ON A MEANS FOR PURIFICATION.

BY W. BIRD HERAPATH, M.D., F.R.S.L. & E.

The recent case of arsenical poisoning in Wiltshire has brought prominently before the public the fact that the processes adopted in the manufacture of the medicinal preparations of bismuth are very imperfect, and permit the presence, in those most useful articles in the Materia Medica, of large quantities of a highly dangerous and noxious substance, namely, arsenic in some form or other; it therefore becomes most desirable that the attention of manufacturers should be called to this circumstance, in order that they might produce an article free from such dangerous impurities. Since my return from Hindon I have examined fourteen different samples of this medicinal agent, amongst which were preparations obtained from the dispensaries of the Bristol Royal Infirmary, the Bristol General Hospital, as well as samples from some of the first pharmaceutical establishments of this city and Clifton also, and in each case I have invariably detected the presence of arsenic. Some of these samples have contained as much as one grain of arsenic in 433 grains of the article examined, others only one grain in 1000 grains; such quantities, although minute when given in the usual medicinal doses, yet, under a similar combination of circumstances to those occurring in the case in question, might lead to very serious consequences, as it would be impossible to establish the fact of a criminal administration of this poison if bismuth in its present impure condition had been administered medicinally.

Some preliminary experiments have shown me that it is possible to remove the arsenical impurities by a very simple process, and one which would not add much to the cost of the material. On boiling either of the insoluble salts of bismuth with a sufficient quantity of solution of caustic soda or potassa, the arsenic is quickly removed in the soluble form, and the residue, on treatment a second time with the same reagent, and subsequently well washing it by means of large quantities of water, and decantation, is rendered perfectly pure and fit for medical purposes. I am not aware whether this process has been

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* 'Dublin Medical Press.'

† 'Lancet,' Dec. 6, 1862, p. 638.

hitherto proposed, but it has succeeded perfectly in purifying some samples of nitrate and carbonate upon which I have tried it in my own laboratory.

The greatest objection to this mode of purification is of course the change which the caustic alkali exerts upon the preparation employed, as the nitrate will be wholly converted into the yellow oxide, whilst the carbonate will be also partially so changed. This process therefore entails the resolution of the oxide in nitric acid and its renewed precipitation as "Trisnitrate" by the addition of water in the usual manner; whilst the waste acid obtained from this precipitated and purified nitrate may be employed for the resolution of the changed and purified carbonate, whence the bismuth may be again thrown down in the pure form by the addition of carbonate of soda to that solution. Thus, by carefully economizing the nitric acid used in the process of manufacture, very little additional expense would be entailed by following this method of purification. A few words may be advisable upon the best means of detecting and estimating the arsenic in preparations of bismuth, as it is not an easy matter to do so by the plan recommended by Rose, and many chemists may readily overlook small quantities like these by depending upon such a method of proceeding. But reduction by hydrogen gas furnishes us with both a ready method of detection and even of quantitative estimation, and in fact was the plan adopted by me in all these analyses. One precaution is necessary however in the quantitative analysis, in addition to all those which ensure the purity of the acids, zinc, and apparatus employed, which is to select a tube of hard green glass, about a quarter of an inch in diameter; then by means of the blowpipe draw it out in successive portions, to narrow its calibre and reduce its weight, and for convenience in heating and weighing, to subsequently bend it into a triangular form; and having carefully counterpoised it, now attach it to the hydrogen gas apparatus (furnished of course with an exit tube, filled with chloride of calcium) by means of a little tube of india-rubber, and having arranged proper supports, it only remains to apply heat at three or four portions of the tube simultaneously by separate spirit-lamp flames properly arranged, and of course having previously allowed the air to escape from the apparatus, and ensured the purity of the gas evolved by heating one of the bends of the tube for some time previous to the introduction of the weighed portion of the bismuth to be tested into the tubular funnel of the apparatus, whence it should be carefully washed down into the gas-bottle by directing a stream of distilled water by a pipette or the ordinary wash-bottle. In this way twenty grains have sufficed for very accurate analysis, as the hydrogen escapes free from arsenic, as may be proved by lighting it at the extremity of the tube and testing it by Marsh's method from time to time in the ordinary way. In the calculation of the percentage it is necessary to remember that the arsenic is obtained as metal, whereas it existed in the sample as an arsenite, either of lime or bismuth; consequently it must be converted into the theoretical quantity of arsenious acid.

It is generally the case that the evolution of gas stops during some minutes after the introduction of the nitrate of bismuth, probably from the production of ammonia by the reduction of the nitric acid, but on the further addition of hydrochloric acid it goes on as before. In this way three or four films of arsenical deposit are obtained, and in great beauty, from the quantity of bismuth I have already named.

I need scarcely say that the hydrochloric acid employed was proved to be chemically pure and free from arsenic, not only by Reinsch's method, employing electrotypic copper for the purpose, but by the more rigorous method of passing the hydrogen gas evolved by it *during one hour* through a red-hot glass tube; this latter method detects a quantity of arsenic perfectly inappreciable by Marsh's usually trusty method of testing for arsenic. The al-

kaline liquid obtained after thus boiling one sample of carbonate of bismuth, about 1 lb. in weight, has furnished me with evidence of the existence of another metallic impurity in bismuth preparations. This will very probably turn out to be *Thallium*, which I have nearly identified, but I am now engaged in the elucidation of this matter.

The hydrogen gas-flame, when a sample of bismuth containing thallium is tested by Marsh's method in a darkened room, by means of a white porcelain plate, gives a brilliant green light where the flame impinges on the plate; the arsenical flame is violet, and when sulphur is present we have a beautiful blue. I have found that thallium may be obtained as a deposit in the red-hot tube like sulphur and of a reddish-brown colour. On heating this whilst the current of hydrogen is still passing through the tube, the green flame is again rendered evident, if it had previously disappeared.

The occasional existence of arsenic as an impurity in the bismuth of commerce was a fact well known to me, but it was not until after my return from giving evidence before the Wiltshire magistrates that I became aware of its almost universal presence; and permit me to express my acknowledgments to Dr. B. W. Richardson for having called my attention to this circumstance, and my subsequent experiments have fully confirmed the truth of his observations.

It is not for me to decide whether this was the source of all the poison in the case in question; *however*, *I think not*, for we should then have to imagine that at least one ounce of impure bismuth had been taken by the patient in order to account for the quantity of arsenic found by me; and, although all the *arsenic had been retained* in the viscera of the deceased, yet, by some extraordinary means, the whole ounce of bismuth had been evacuated with the exception of a mere trace, for scarcely one-twentieth part of a grain remained—a difficulty which, in my opinion, it is impossible to overcome.

Bristol, 32, *Old Market Street*, *Dec.* 6, 1862.

P.S.—Since the above was written I have found three samples of bismuth tolerably free from arsenic—only the most minute traces to be obtained in the tube. These samples were, two prepared by the Messrs. Howard and Sons, and a specimen of carbonate made by Mr. Schacht, of Clifton; all other samples, more than twenty in number, were decidedly very arsenical.

ON ESCHWEGE'S PURE NAPHTHA, AND ITS USE IN THE ARTS AND MANUFACTURES.

BY JOHN TUCK.

Wood naphtha, pyroxylic spirit, or the hydrated oxide of methyle, C_2H_3O,HO, discovered in the year 1812 by Taylor, forms, as is well known, one of a numerous class of homologous bodies derived from carbide of hydrogen radicals, the most important of which is the hydrated oxide of ethyle, or alcohol.

These bodies differ from each other in their elementary composition merely by a definite number of equivalents of carbon and hydrogen; thus the compound radicals of naphtha and alcohol are respectively methyle, C_2H_3, ethyle, C_4H_5; and their corresponding oxides, the hydrated oxide of methyle or naphtha, C_2H_3O,HO, hydrated oxide of ethyle or alcohol, C_4H_5O,HO; and their other salts differ only by C_2H_2,

One great and distinguishing difference, however, between these two analogous bodies is in the mode of their production; naphtha never being produced by any fermentation whatever, while, on the other hand, alcohol is only pro-

duced by fermentation in any commercial quantities. They both have many properties in common when *in a pure state*, being limpid, colourless liquids of pungent and agreeable taste, free from the slightest disagreeable odour, and miscible with water in all proportions. The essential oils, resins, some of the alkaloids, and a great number of saline compounds, especially the deliquescent salts, are readily soluble in both; hence their great importance in the arts and manufactures.

As stated before, naphtha is never produced by fermentation, and is only obtained as a bye-product of the destructive distillation of wood, and is found in the liquid products of the distillate, along with acetic acid, acetone, several ethereal liquids, tarry and resinous matters, and oily hydrocarbons, some of which are in a partially dissolved state.

These condensed liquid products, after being allowed to rest some time in a tank or other suitable vessel, separate into two layers by the tarry and resinous matter sinking to the bottom, whilst the spirituous and acid liquor forms a supernatant layer, which is usually drawn off, and in its passage made to percolate through a filter formed of coarse gravel, by means of which a great portion of the tarry and other matters mechanically suspended are separated.

The next process is to separate the spirituous from the acid portion of this crude liquor, which is done in two ways: firstly, by distilling it direct from the crude liquor; secondly, by neutralizing it first by lime, a d then distilling. In both cases, however, heat is applied till about one-fifth of the contents of the still is condensed in the receiver. The weak spirit thus obtained is next subjected to repeated distillation, in order to obtain the spirit in a more concentrated form, and which is finally rectified by distillation with lime, or with a mixture of lime and caustic potassa. The naphtha as thus obtained, and as is usually met with in the market, is colourless, and of a peculiar, strong, and disgusting odour, and not at all potable even after very large dilution. For these reasons it has hitherto been of no service in some of the finer requirements of the arts and manufactures; and when formerly used, it was only on account of the enormous price of alcohol in this country, previous to the granting of that great boon, methylated spirit. It is stated on good authority that the United Kingdom produces about 66,000 gallons of naphtha annually. This peculiar, strong, and offensive odour and taste in naphtha is owing to the presence of certain volatile oily hydrocarbons necessarily formed in the process of its manufacture, as may be seen from this rough outline of it, and from which it has hitherto been found utterly impossible to free it, on a commercial scale, by any known process. Now, however, such can be done, and to M. Eschwege belongs the credit of having succeeded in removing entirely these oily or other impurities, and of rendering the naphtha *free from odour, potable, and fit for many, if not all, of the purposes to which pure spirit of wine is now applied.*

This process of purification is effected *without any chemical change whatever taking place, and in a manufacturing point of view can be readily and economically carried out.* Samples of naphtha and various other spirits in their crude state, and after being purified by this process, are to be seen at the present International Exhibition,* Class 2, south-east passage of the Eastern Annexe.

Having, through the kindness of M. Eschwege, had some of his purified naphtha placed at my disposal for examination, I found it to be, as stated, entirely free from any disagreeable odour, as odourless in fact as spirit of wine, and quite potable; in order to test which I drank it in one and two drachm

* This paper was written in October.

doses, diluted with four parts of water, *without experiencing nausea, sickness, or the slightest uncomfortable sensation*. I noticed, however, one thing in connection with it, that it did not taste so fiery on the tongue as alcohol. In order to meet every objection, and as a conclusive proof of the nature of this potable liquid, I submitted it to the action of oxalic acid, and thereby converted it into the beautiful crystals of oxalate of oxide of methyle (MeO,C_2O_3), and this test must be allowed by all to be a positive proof of its being naphtha.

All of the essential oils and odorous substances used in perfumery are, as far as my experiments have gone, just as soluble in it as in spirit of wine; and some of the perfumes which I have made, using only this pure naphtha as a solvent, have a much finer and more delicate odour, and have even been preferred to others made the usual way with spirit of wine. I find the following essential oils are as soluble in purified naphtha of specific gravity ·812, and in some cases even more so, than in the usual spirit of wine of commerce 56 o. p. :—Ol. Anethi, Anisi, Anthemidis, Bergamotæ, Cajeputæ, Carui, Caryophylli, Cassiæ, Cinnamomi, Citronellæ, Crotonis, Cymini, Geranii, Juniperi, Lavandulæ, Limonis, Menthæ, Origani, Pulegii, Rhodii, Rosmarini, Sabinæ, Verbenæ.

I think the above facts are quite sufficient to prove that we have in pure naphtha a new and highly valuable menstruum for use in perfumery, and in making the various essences for flavouring and other purposes, and which it is very probable will prove as great a boon to this, as methylated spirit has to other arts and manufactures. It is also well adapted for making the finer kinds of spirit-varnishes, to be used in cases where even the little odour of methylated spirit is objectionable, if anything freer from odour and as effectual could be obtained at a reasonable price, and in cases where spirit of wine is often even now used, such as repolishing furniture in inhabited houses, in varnishing walls to prevent damp coming through, for mixing with water to form evaporating lotions in the sick room, for burning in lamps as a cleanly and cheap source of heat in experiments, etc., for singeing horses in cases where the odour of methylated spirit is objectionable; and, although I have made no experiments on this subject, I should think it was well adapted for making transparent soap; and there is no doubt but that it will be used for numberless purposes which experience will prove it to be adapted for.

As regards its use in pharmacy, I see no valid objection against its being used in the manufacture of all tinctures (as its solvent powers are almost identical with spirit of wine), and in every case where spirit of wine is now used either as a solvent or from its preservative effects; but I wish it to be distinctly understood that I do not advocate its use in any one case, until official permission is given for using it.

Since writing the foregoing, I find that Mr. Draper, of Dublin, has published a paper in this Journal, on the "Purification of Pyroxylic Spirit," in which he states, "I am of opinion that, in its present form, the patent process just described is not adapted to the purification of wood-spirit on a manufacturing scale." This paper called forth a letter from M. Eschwege in the 'Chemical News' of November 15th, in which he states that the cost of purification will be under sixpence a gallon of full strength on a large scale, and he has offered, to quote his own words, "with a view to facilitate researches into its properties, to place at the disposal of any one scientific institution not too distant from the British Museum, an apparatus which I had made, to come to practical results, and to have there purified, under my directions, any quantity wanted merely for scientific purposes."

Wilton, near Salisbury, Nov. 19th.

ON THE SPECTRUM OF CARBON.

BY DR. JOHN ATTFIELD, F.C.S., DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY.

The light from the greater portion of a candle-flame is well known to be derived from a number of little particles of white-hot *solid* carbon. But at the base of the flame there is always a thin shell of blue light derived from incandescent *vapour* containing carbon. It has already been shown in this Journal (Miller's Lecture on Spectrum Analysis, Vol. III. 2nd series, p. 411), that when luminous solids are viewed through a prism the light they emit is seen to consist of rays of all colours: from the red to the violet extremity the coloured appearance, or "spectrum," is continuous, but that luminous gases give a spectrum composed of only a few colours. The spectrum of the light from the solid carbon of a candle-flame resembles that of all other luminous solids, but the spectrum of the blue light at the base of the flame contains but few rays, their colours being faint yellow, light green, bright blue, and deep violet. Such rays are common to all flames containing carbon, and are absent in flames which do not contain that element: the inference is that they are due solely to carbon.

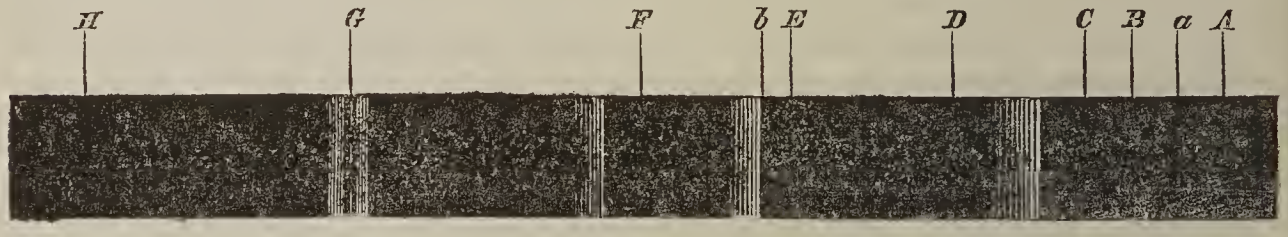
At the lecture above alluded to, various elements were vaporized and their spectra exhibited to the audience. Carbon cannot, however, be so treated, the most intense heat that can be produced being inadequate even to fuse it; but when combined with certain other elements carbon can easily be obtained in the gaseous state. Carbon and oxygen, carbon and hydrogen, carbon and nitrogen, and carbon and sulphur combine to form compounds, any one of which can be ignited to the point at which it gives out light. In working out the spectrum of carbon, the light emitted by each of these compounds has been examined. The details of manipulation by which this was accomplished need not be described here, the subject being of insufficient interest to the pharmaceutist; moreover they are contained in a paper recently communicated to the Royal Society and published in the Philosophical Transactions. It will be sufficient to state that jets of carbonic oxide, olefiant gas, cyanogen, and bisulphide of carbon were burned in an atmosphere of pure oxygen. Under such circumstances solid carbon cannot be deposited in the flames, and light giving a continuous spectrum is consequently not emitted. At the same time the light evolved from the incandescent vapours is intensified, and therefore more favourable for observation by the prism. On examining these flames, the rays whose colours have been mentioned were found to be present in every case. Now, although the spectrum in each of these experiments was composed of rays emitted by three elements, only two, viz. carbon and oxygen, were present in every flame. That the rays in question were due to carbon only was proved by igniting the gases in closed glass tubes, from which oxygen was excluded. This was accomplished by sending a current of electricity through hermetically sealed tubes containing small quantities of each of the carbon compounds. In each case the characteristic rays were detected in the light thus produced.

The spectrum of carbon is a very beautiful one. The lines composing each band of light regularly diminish in brightness in the direction of greatest refraction, and appear to retreat from the observer like pillars of a portico seen in perspective. It differs greatly from that of every other element that I am acquainted with; and though, in each of the experiments described, it was of course accompanied by the spectrum of either nitrogen, hydrogen, sulphur, or oxygen, its diagnosis was not thereby interfered with; it is, in fact,

most widely different from, and cannot possibly be confounded with, either of them.

The brightest band of the carbon spectrum being blue, and its other constituents being on the one hand light green and on the other violet, the associated rays of ignited carbon vapour, as indeed seen by the naked eye in carbon flames, I conceive to be of a light-blue colour. The tint may be observed in the flame of a spirit-lamp, in a burning jet of carbonic oxide, in the blowpipe flame of any hydrocarbon, and at the base of a common candle-flame. I have no hesitation in saying that should a source of heat be found of sufficient intensity to volatilize the diamond and ignite its vapour, blue will be the colour of the light emitted.

The prismatic apparatus, or "spectroscope," used in these experiments was similar to that figured at page 406, Vol. III. 2nd ser. of the 'Pharmaceutical Journal.' The annexed uncoloured woodcut of the carbon spectrum is made on a scale corresponding with that of the spectra exhibited at page 409 of the same volume; the letters refer to the prominent dark (Fraunhofer's) lines in the solar spectrum.



A NEW DEVELOPMENT.

BY MR. JOSEPH INCE.

The Pharmaceutical Society as at present constituted, represents the Science, but not the Trade interest of the community of druggists; partly for this excellent reason, that its founders aimed at broad principles, and left the details to be worked out by individual effort; partly also because even they had to share the common lot, and to wait until by slow and sure degrees they had secured the confidence of the members; and partly because they knew that to waste their energies on each and every object that might have claimed their notice would have resulted in their achieving nothing. Let then the founders of the Society receive due and ample credit for having raised English Pharmacy into something like a Science; but still an advancing age demands special and new developments. I am about to urge one claim, which I trust will not be rejected simply on the score of novelty.

There are in England a vast number of establishments called chemists and druggists' shops; they are found in every style of building and arrangement, some large, some small, some plain to ugliness, some lavishly ornate; but whatever be their outward characteristics, they are one in this, that they profess to gain a living by the sale of physic. Should any one perchance take an inquiring walk along the streets, he may notice (in London more particularly) the scanty accommodation offered for ordinary laboratory purposes, and should he continue his research by the light of a good directory or by the aid of private information, he will discover that in most cases no laboratory exists. It is then self-evident that the various preparations used, with the exception of minor compounds, are purchased as necessity requires, according to the private judgment or the trade experience of the Pharmaceutist. We may safely infer that all spirits and extracts, together with most ointments, tinctures, and confections, are thus

added to the stock. One class of remedial agents form the exception, namely, the officinal distilled waters. The fact has long been recognized by our London College that these distilled waters were manufactured, that is to say extemporized, and therefore it kindly sanctioned a practice which probably it could not help. Hence we get this formula for Aqua Anethi :—

R. Anethi contusi
libram cum semisse ;
Aquæ, congios duos :
destillet congius.

Vel

Anethi Olei ʒij ;
Silicis contriti ʒij ;
Aquæ destillatæ, congium :
Oleum primo cum Silice, postea cum Aquâ
diligenter tere et liquorem cola.

Suddenly in the middle of the night, the unhappy druggist is summoned from his slumbers ; a child has screamed itself into fits, "which," says the parent, "is the more extraordinary, for we have given it three full doses of dill." The truth is, the luckless infant has been favoured with the *Vel*, P.L., and the vile compound, as might confidently have been anticipated, has induced active inflammation.

Moreover the London College makes a strange remark on the subject of Aqua Menthæ Piperitæ :—

"R. Menthæ Piperitæ exsiccatæ libras duas ; Aquæ congios duos : destillet congius ; si herba recens adhibeatur, duplo ponderc utendum est. Hæc Aqua *citius* e Menthæ Piperitæ Oleo præparari potest eodem modo quo Aqua Anethi."

The College and the apprentice-boy entertain this idea in common, that it is easier to shake up oil and water than to obtain either fresh or dry peppermint and properly distil the herb. The Dublin College follows suit, making also a virtue of necessity, well knowing that the Pharmaceutist does not distil his waters. A convenient essence is therefore recommended, for instance :—

Aqua Cinnamomi.
R. Ess. Cinnam. ʒj ;
Aquæ destillat. ½ gallon.
Mix with agitation and filter through paper.

The essence is thus prepared :—

R. Ol. Cinnam. ʒj.
Sp. rectif. ʒix.
Mix with agitation.

He who has once seen, and smelt or tasted the genuine Aqua Cinnamomi, will mix his next batch with more than usual agitation ; nor could a better study be suggested than for him to examine with a microscope of high power the points of resemblance between the relative products of distillation and the shake.

It is by no means the intention of this paper to pass strictures on any class of preparations, but it is most earnestly intended to bring into the utmost prominence the fact that Pharmaceutists as a body rely on extraneous sources for the very things on which their reputation hangs ; and that the one authorized substitute which their college allows and indicates, places them at a disadvantage. This undeniable evil results from the force of circumstances, no blame whatever attaching to the Pharmaceutist. How few can afford a laboratory ! and let us not hesitate to acknowledge that the ordinary run of business could not justify the outlay. Where (recollecting the usual space

available) would the most willing and intelligent druggist plant a still or erect the most unpretending furnace? or in what portion of his back premises would he set up an evaporator of the most limited dimensions? "I feel grateful for the elephant," said the mayor of a provincial town, "but wherever shall I put it?" and the beast was declined with thanks. Let us remember also that a small laboratory is a great folly; no care or ingenuity can make it answer; it eats off its own head in expenses that are hugely out of proportion to the work effected. In this manifest dilemma, who shall rescue the Pharmaceutist? Who shall throw over him the timely ægis of a protecting hand? No other than the same power that years ago raised him into an intellectual and respected man of science—his own Society.

I humbly and respectfully suggest, that it is now, though it has not been hitherto, the duty of the Pharmaceutical Society, with all due care and deliberation, to put itself in such a position that from its own central laboratory it should be able to supply to every Pharmaceutical Chemist, at a fixed and reasonable rate, four classes of pharmacopœial preparations:—

I. Distilled waters.
II. Extracts.
III. Spirits.
IV. Tinctures.

I have purposely limited the selection to these four only; and perhaps it would be needless for me to remark that these should be prepared literally and strictly in accordance with the directions of the College, and that no manager or assistant should be allowed to depart a hair's breadth from the official instructions. There would then exist a series of definite and reliable preparations within the known reach of every pharmaceutist. Nor would the existence of such a series at all limit individual skill, for the druggist, thus released from a pressing difficulty with which unaided he could never cope, would be free to turn his attention to that large field for manipulation, success in which will to the end of time make the difference between one house and another. I proceed to say further, that the plan proposed is not overweighted with essential difficulty. I have great faith in a man and a pan, if the first be but sufficiently skilful and the second adequately large; nor am I by any means sure that the present resources of the Society are not equal to the emergency. I have my suspicions that wonderfully little outlay would ensure the scheme success.

Were other than the four things mentioned added to the list, the original intention would be shipwrecked. The Society would then cease to be an authorized store of pharmacy; would assume the position of a questionable retail shop. and might in time sink down to supplying cherries filled with lip-salve, and President's Bouquet.

Such an idea is not contemplated. I cannot however think the idea too romantic, that the members of the Society should be able to obtain at a fixed reasonable price, from their own natural representative, those four leading pharmacopœial preparations which they are manifestly unable to manufacture for themselves. I do not at the present moment see any conclusive argument against this scheme, though I anticipate many objections, from which I have selected four:—

1. The scheme is new; it is an invasion of preconceived ideas; it shocks the routine of customary foregone conclusions. The Society is supposed to educate and examine, and then, so runs the theory, its mission ends. After all, there is much in habit, our thoughts as well as our actions are to no small extent hereditary, and in the ordinary routine of life we take the exact

mould and pattern of our forefathers. We resemble the compliant damsel in the French play, whose father wishes her to marry to the best advantage. As one suitor after another claims her hand and meets with her parent's approbation, she passively returns the one invariable answer, "Oui, mon père." The despotic father changes his mind as often as he scents a better offer, and just as often the daughter murmurs, "Oui, mon père." No matter whether the future partner be tall or short, stout as an alderman or thin as a workhouse curate, her father's will is law, and had the "last of the Mohicans" proposed, she would still have answered, "Oui, mon père."

2. It may be urged that pharmaceutists can already obtain pharmacopœial preparations from the Hall. I answer, there are no mutual obligations existing between the apothecaries and ourselves; they are a trading community, and must trust, like all other trading bodies, to the general public: moreover, that it is the duty of our own Society to provide for its own members, just as a good father trusts not to the best regulated parish either for his children's education or their keep.

3. The objection may be raised that such a scheme might interfere with private business, or prove an injury to retail trade. What difference will it make to Chemicus from what particular source his neighbour gets his goods? Do pharmaceutists trade with one another?

4. There *is* a fourth objection, strong and weighty, one that may indeed prove fatal. The poor man's jokes are seldom laughed at, but he becomes witty when he by chance grows rich. My thoughts may seem visionary and romantic, coming as they do unfriended into notice; but let a few members of the Council smile upon the new development, and it will cease to appear absurd.

26, *St. George's Place, Hyde Park Corner.*

PHARMACEUTICAL PROGRESS.

A FEW LINES TO PHARMACEUTICAL STUDENTS.

TO THE EDITOR OF THE 'PHARMACEUTICAL JOURNAL.'

Sir,—At the risk of being considered a pedant, I have presumed to take up my pen for the purpose of addressing a few lines to the junior branch of those who aspire to the title of "Chemist and Druggist," in the hope that a word or two (the result of experience) may be useful to some who may take the trouble to read them.

I know of nothing more truthful than the sentiment expressed by the greatest philosopher who ever lived, "In all labour there is profit." It is true even in its minutest detail, and is a sentiment which the proudest of earth's philosophers of modern times would not (and could not if they would) gainsay. With this thought in view, let us not be discouraged, or imagine that because a chosen few have done great things, and risen to eminence, *greatness* belongs *alone* to them. Some, in truth, have been men of genius and polished erudition; yet, be it remembered, these are not always the prerequisites which ensure success. Brilliant lights indeed they have been, to illumine the dark path of scientific investigation; yet there are bright scintillations which do fall from minds less favoured, and these are necessary to make up the sum of human usefulness and human power.

Poetry and song, the sparklings of native talent and brilliant perception, may—nay, often do—move a nation; yet they do not maintain its power, sustain its stability, or embody its laws. Deeper thinking, harder working, and more obscure minds are necessary for these; and it is, without doubt, the

quiet, plodding mind, which *in the main* exerts the mightier and more permanent influence.

This little outline, then, applies to the special subject on hand.

There is an objection, very common, raised, in the form of a question—What advantage will there be to me in studying the higher branches of science? I cannot see its utility, therefore am indisposed to follow it.

In this question-like objection there is both *force* and *folly*,—force in the question, but folly in the conclusion. It does not follow that because a thing *appears not* at first sight to be useful, it therefore cannot be.

The writer has lived to deplore such ill-timed haste, and ofttimes regrets that he did not dig deeper into the treasure-mine of knowledge, when younger days and more leisure afforded the opportunity of doing so.

The resulting benefits arising from a well-stored mind, be it remembered, are not immediately realized: this, in the very nature of things, cannot be: they are progressive: they live, it may be, infusorial-like, unseen, but they are there, to be seen and felt in the future, and the ultimate success of every individual in life depends upon the habits contracted in early youth and incipient manhood.

What advantage, then, is there to a youth just entering upon his 'prentice-term, or a junior already in harness, in a systematic course of study in the various departments of science connected with the business of a chemist and druggist? Much every way.

Existing examinations are *objects to work for*: without such a stimulus the inducement to *work in earnest* would be small; and the benefits arising from such a stimulus are in themselves obvious. The knowledge necessary for these examinations, when once attained, can never be entirely lost; it furnishes a groundwork upon which the experience of after years may safely build, and that rising fabric will prove the power it possesses of reducing the once *youth day* theories to the practical usefulness of riper years.

It is true, the public do not appreciate scientific attainments as they ought, nevertheless this is no valid excuse for their non-possession.

Public appreciation of true progress is a plant of exquisitely *slow growth*; our duty is to bear patiently with it, and work on in advance, while it slowly climbs the altitude where light is seen.

Patient study is a prerequisite to success, and proficiency is a passport to the higher walks of life; and all that is worth doing is worth doing well.

It too often happens, we know, that retail drudgery and pure science make but an ill-assorted pair; nevertheless, as rough stones are necessary to make good roads, even so are the little disagreeables of advancement necessary to pave the way to the promised goal of better things. Chemistry is the keystone to many a treasure-mine of knowledge; it unravels mysteries in the past, and possesses a fascination which impels to labour and appreciation.

If you take the mere mercenary ground of profit and loss, we do not hesitate to affirm that the scientific and literary man is in an infinitely better position to reap the advantages of *pecuniary emolument* than the man whose sole aim is to blunder through the world, and live by his wits, regardless alike (too often) of fair dealing, morality, or even honesty.

Again: the application necessary for the work will furnish such a taste for general and useful reading, as may never have been possessed without it; and if this was the only advantage given, it would be well worth the labour.

It gives a man something to fall back upon, and renders the wet days and dreary hours (which hang so heavily on some) both pleasant and profitable; and this spare time is filled up by some favourite pursuit, which flings a gleam of sunshine (mental though it may be) over an otherwise darkened path.

Opportunities neglected *now* will produce regretful feelings by-and-by;

therefore we would say to our younger brethren, work while the heyday of youth and opportunity last; leave not a solitary stone unturned which may be a stepping-stone to progress, for opportunities lost can *never* be regained; let the experience of those who have gone before act as finger-posts for the cross-roads, to guide you in the track which leads to eminence and success, and bear in mind the fact, that

> "Lives of great men all remind us
> We may make *our* lives sublime,"—

sublime only as we submit to the crucible of education and hard work, without which no man can ever clutch the staff whereon hangs the banner flaunting in the breeze, bearing its strange device "Excelsior."

Strongly would the writer recommend the laboratory, for a *short time at least*, believing that an hour's practical dealing with facts is worth many hours of reading; and *contact with other minds* sharpens, brings out latent ideas, relieves a multitude of vexing difficulties which often arise from books, and thus renders the burden light.

And now, last, but not least, we have another inducement and source of profit, the *locus standi* of the future Pharmaceutist.

Slowly, it is true, but firmly nevertheless, the *united body* has advanced, and by their gradual achievements are proving that union is strength. The last Juries Act (thanks to our indefatigable Council, and our best thanks too) has conferred a great boon on the present Pharmaceutists; and this grant augurs well for the future: it is another legislative recognition of Pharmaceutical chemists, which will lead on to something greater in the future; but the only way by which such a long sought-after and desired object is to be attained, is, by a thorough determination on the part of all engaged in and entering upon the business of chemist and druggist, to render themselves proficient by study, and prove by their attainments that they are worthy to rank in the list of Professions, and be right-hand supporters to the faculty.

Other things might be brought forward, did time and space permit; but enough, we hope, has been said to lead to reflection on the subject, and give a little *impetus* to some who may be *sluggish* by the way.

Yours faithfully,

G. G. Hornsby.

Cheltenham, Nov. 13th, 1862.

PHARMACEUTICAL FALLACIES.

Under the above heading, Mr. Haselden, at page 275 of this month's Journal, objects to my proposition for a fee for Certified* Prescription Copies (Vol. III. 2nd ser. page 223) in these words:—

"It is most difficult, I acknowledge, to find a good cure for this fallacy" (viz. the *giving* of copies); "a charge for a copy would not effect it, and would involve, in addition to the appearance of ill nature, a character for covetousness. A firm but polite objection to give more than one copy of any prescription at one time suggests itself perhaps, under existing circumstances, as the best and safest course."

I see no cure for the evil in refusing to copy prescriptions; as prescribers multiply, more and more copies will be required, and if the system is worked profitably, more the better. Now there can be no doubt that chemists are better qualified for the correct performance of the duty than the general pub-

* A sheet of note-paper with a printed form at the bottom, after this style, would answer: "I certify the above to be a correct copy of the prescription registered No. — Signed —."

lic ; and in many instances, the copy, now so frequently misplaced, would be carefully preserved, whilst at the same time the chemist's care and responsibility would be better appreciated, if a moderate charge was made. If such terms are applicable to either plan, it appears to me that *refusing* a copy has rather the appearance of ill-nature and covetousness than *selling* one.

Another fallacy referred to by Mr. Haselden is the unreasonable lowness frequently made for dispensing prescriptions. In Journal, Vol. III. 2nd ser. page 338, I directed attention to a pharmaceutical trade-mark to be understood by chemists everywhere, as a likely means of improvement. I confess the proposal has not received much favour, yet I felt assured its adoption, especially by the leading metropolitan houses, would materially lessen the diversity of provincial charges ; perhaps an Edinburgh friend can inform us of the working of the plan in existence there.

The question of fallacies is not exhausted; there are other practical evils in the customs of the trade which will bear a little light, and perhaps their discussion in the Journal may be beneficial to the interests of the members at large.

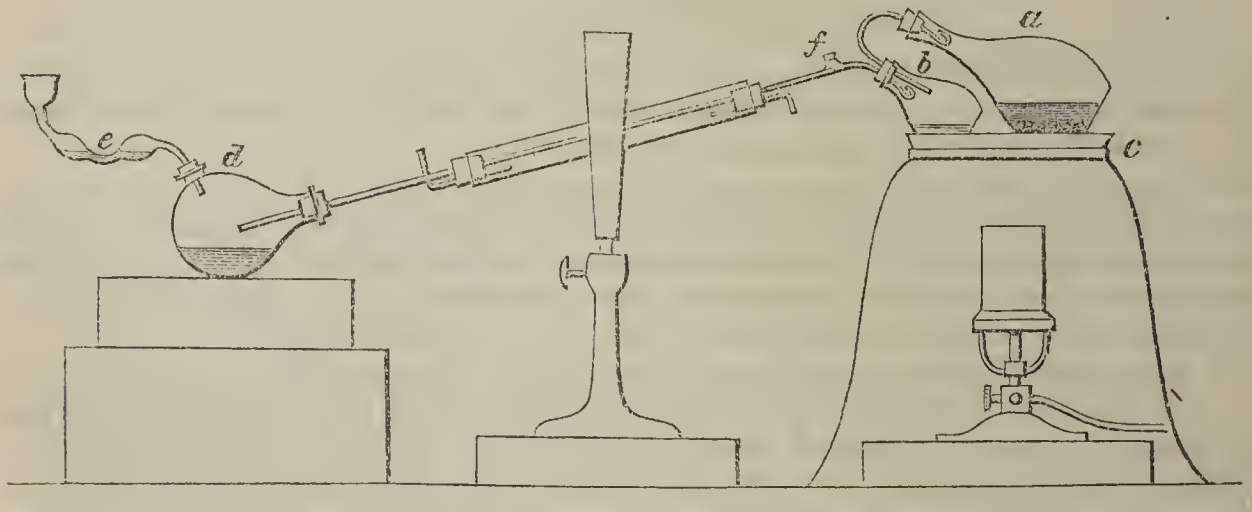
W. Jabez Halliday.

65, *Bury New Road, Manchester, December* 17*th*, 1862.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

On the Estimation of Nitric Acid.—Mr. Vernon Harcourt has communicated to the Chemical Society what appears to be a valuable process for the estimation of nitric acid. It consists in converting the acid into ammonia by the action of nascent hydrogen. When a moderately concentrated solution of potash is poured upon a mixture of granulated zinc and iron filings, hydrogen is freely disengaged even in the cold. The addition of a nitrate to the mixture is followed by an immediate development of ammonia. This constitutes the reaction employed by Mr. Harcourt, and the following is his description of the process :—

" The apparatus employed for quantitative determinations is represented, on a scale of one-eighth, in the following figure.



The flask *a*, which has a capacity of 200 c.c., is designed for the generation of ammonia by the mutual action of nitric acid, zinc, iron, potash, and water. It is connected by a bent tube, drawn out and recurved at its extremity, with the smaller flask

or bulb *b* ; and the two are so arranged, that they both rest at a considerable angle of inclination upon the sand-bath, *c*. The smaller flask is connected with a condenser with leads into the tubulated receiver, *d*. In the upper part of the condensing tube is a small tubulure, *f*, closed during the distillation by a plug of india-rubber. The tube, *e*, which is provided with two or more bulbs and a funnel-head, has the shape indicated in the figure. It is fastened into the tubulure by means of a perforated plug of caoutchouc, which, when slightly greased, makes a tight and supple joint. A standard solution of sulphuric acid is used for the collection and determination of the ammonia. The excess of acid employed is finally determined by means of a standard solution of caustic potash.

"The following is the course of the operation :—The funnel-tube, *e*, is brought into a vertical position, by being turned round in the tubulure through half a circle ; a quantity of standard acid from a burette is passed through it into the receiver, more than enough to neutralize all the ammonia that can be formed. Some litmus solution is added, to render visible the progress of the action. The funnel-tube is then restored to a horizontal position, and its bulbs filled up to the proper level by a few drops more of the standard acid. The total quantity of acid that has been taken, is now read off upon the burette. The flask *a* is then removed, its tube and cork, together with the smaller flask, which should contain a little water, remaining in position upon the sand-bath. Into it is introduced about 50 grms. of finely granulated zinc, together with half that quantity of iron filings, which have been cleansed by sifting, and ignition in a covered crucible ; a weighed portion of the nitrate to be determined is then introduced, with water sufficient to dissolve it ; lastly, a measured quantity of a solution of caustic potash, free from nitre, is added, and the flask immediately replaced. It is essential that the quantity of the metals, and of the potash employed, should greatly exceed that proportion which is theoretically necessary for the complete conversion of the nitric acid. In my experiments with nitre, I have generally taken about 0·5 grm. of that substance, 20 c.c. of water, and 20 c.c. of a solution of potash, sp. gr. 1·3. Provided the quantity of potash be sufficient, it is immaterial in what degree its solution is diluted, since, in the course of the distillation, it passes through every stage of concentration. It must not be highly concentrated at the commencement of the operation.

"Heat is now applied to the part of the sand-bath immediately beneath the larger flask, and the fluid is gradually raised to the boiling-point. If the bubbles of air and hydrogen pass at a moderate rate through the bulb-tube, *e*, there is no risk of a loss of ammonia. When distillation has commenced, the lamp is so placed that the water in the smaller flask *b* may also boil gently. The fluid is thus twice distilled in one operation, and the traces of potash which escape from the flask *a* are effectually retained in the flask *b*. The end of each of the two exit-tubes is drawn out, and bent into a hook for further security. Repeated experiment has proved the sufficiency of this arrangement for keeping back in a slow distillation everything that is not volatile. The quantity of the fluid in the flask *b* can be regulated by adjusting the position of the lamp. The distillation, which should occupy from one to two hours, requires only occasional attention. It may be terminated when hydrogen gas, which is evolved in larger quantity as the potash becomes concentrated, has been passing regularly, for five or ten minutes, through the bulb-tube, *e*. When the fluid in *e* has receded, as the apparatus cools, into the inner bulb, the caoutchouc plug is withdrawn from *f*, and a stream of water poured into the condensing tube, to preclude the possibility of ammonia being retained upon any portion of its surface. The tube, *e*, is then turned round into the vertical position, and water is passed through it two or three times, after which it is removed, and the tubulure of the receiver closed by a cork. Finally, the receiver itself is disconnected, and the end of the condensing tube is rinsed externally, and the determination is completed by adding standard alkali from a burette to the fluid in the receiver till a change of colour appears. Collection in hydrochloric acid, and precipitation by chloride of platinum, may be substituted, but the volumetric method gives perfectly sharp results.

"The zinc and iron which remain in the generating flask need only to be washed with water, with dilute acid, and again with water, to be ready for a second determination. Metals that have once been used, generate hydrogen far less actively than

zinc with a bright surface, and freshly ignited iron; but the production of ammonia proceeds as readily with one as with the other. It may be safely assumed, that the presence of any salts which are without action upon caustic potash, or upon zinc and iron, will not interfere with the reaction upon which this method depends. The experiment was, however, made of mixing weighed quantities of nitre with various proportions of sulphate of potassium and chloride of sodium. The presence of these salts did not affect the result."

On the Preparation of Peroxide of Hydrogen.—M. F. Duprey has communicated to the French Academy an extremely simple method for the production of peroxide of hydrogen, or oxygenated water. It consists in passing a very rapid current of pure carbonic acid through distilled water, into which peroxide of barium is projected from time to time. Decomposition takes place, carbonate of baryta is formed, and a solution of peroxide of hydrogen in a state of purity is obtained. When the quantity of carbonate of baryta formed is so great as to interfere with the passage of the gas, the precipitate is allowed to subside, the clear liquid decanted, and the process continued with it. A highly-charged solution of perfectly pure and neutral oxygenated water is thus produced, which may be further concentrated by evaporation *in vacuo*. Care should be taken to keep up such an abundant stream of carbonic acid that the small portions of peroxide of barium, as they are thrown in, shall meet with a decided excess of the gas. It is also important to have the peroxide of barium very finely powdered, as otherwise the larger particles escape decomposition.

In all the author's experiments the carbonic acid gas was washed by bubbling through flasks containing carbonate of lime, in order that it should be unmistakably evident that the action was solely caused by the carbonic acid. The author considers that the best reagent for peroxide of hydrogen is permanganate of potash, which it decolorizes, accompanied by an evolution of oxygen. He recommends this reagent for estimating the strength of oxygenated water, and states that it is very delicate. By this process peroxide of hydrogen is rendered easily accessible to the chemist, and will no doubt prove a useful reagent in a number of cases. M. Chevreul has already examined its action upon a number of vegetable colours. Thus, he found that syrup of violets, infusions of litmus, of brazil-wood, and of campeachy, were slowly decolorized by its action. A diminution of colour was quite perceptible after ten minutes, and in twenty-four hours the bleaching was complete. He concludes that the action of oxygenated water upon organic colouring-matters is similar to chlorine water, but more gradual.

On the Estimation of Sulphides in Crude Soda Ash.—M. H. Lestelle states that it is important to the manufacturer to ascertain the exact amount of soluble sulphides present in soda ash; that the proportion is very variable, and much affects the quality of the product. He gives the following simple and expeditious method of effecting the determination. It is based on the fact, that when a solution of ammonio-nitrate of silver is added to the crude alkali, the sulphide of silver is the only insoluble salt which can be precipitated, the other argentic salts being held in solution by the ammonia.

A normal solution of ammonio-nitrate of silver is prepared by dissolving 27·69 grammes of pure silver in nitric acid, adding to the liquid 250 cubic centimètres of ammonia, and diluting with distilled water until the bulk of the solution is exactly one litre. Each cubic centimètre of this liquid is equal to 0·01 of monosulphide of sodium. The substance to be analysed is dissolved in water, ammonia added, and the solution raised to the boiling-point. The normal solution is then added, drop by drop, from a burette graduated to tenths of cubic centimètres until the precipitation of black sulphide of silver ceases. This the author appears to ascertain by filtering a drop or two of the liquid occasionally, and testing it. When the percentage of sulphide to be estimated is exceedingly small, he employs a more dilute normal solution, each cubic centimètre of which corresponds to 0·005 grammes of sulphide. Each assay occupies about five minutes. M. Lestelle states that all well-made soda ash contains from 0·1 to 0·15 per cent. of sulphide; and that badly-made soda, which has been too long exposed to the action of the fire, and is designated as "burnt soda," contains from 4·5 to 6 per cent.

A New Dialysing Medium.—M. Ern. Guignet has experienced some difficulty in the employment of parchment paper as a dialysing medium in certain cases, in which it is acted on by the solutions. He appears to entertain some doubts of the truth of Professor Graham's proposition, that the parchment paper is actively concerned in the result by virtue of its colloidal property of becoming hydrated, and has sought to obtain some other substance which should admit of more general application. The medium which he recommends is *porous or unglazed earthenware*, such as is used in the construction of porous cells for batteries; in fact, he seems to have used battery cells in some of his experiments. He states that, with the employment of this medium, he has obtained all the important results described by Professor Graham, together with several which it would have been impossible to realize with parchment paper. The following are some of his experiments, which are interesting and suggestive, although not sufficiently numerous or precise to be conclusive :—A porous vessel filled with pure water was placed in a solution containing gum and sugar; at the end of twenty-four hours a great part of the sugar had traversed the porous vessel and passed into the water, but not a trace of the gum.

Caramel and bichromate of potash were in a similar manner rapidly separated; the salt passing through the porous vessel into the pure water, and leaving the caramel behind. A drop of the mixed solution allowed to fall upon the porous porcelain, gave a brown spot, surrounded by a yellow circle of bichromate, which the author considers evidence of the greater diffusibility of the salt.

A porous vessel of pure water was placed in an ammonio-cupric solution of cotton; the water became blue, while the cotton remained in the outer liquid.

Experiments were also made to replace water by other liquids, such as bisulphide of carbon, and essence of turpentine. Iodine, sulphur, and naphthaline pass through porous earthenware with very different degrees of rapidity, when dissolved in bisulphide of carbon, the first being much behind the others.

ON VARIATIONS OBSERVED IN THE WATER OF HYDRATION OF SULPHATE OF QUININE.

BY MM. E. MILLOW AND A. COMMAILLE.

The authors state, that the most recent treatises on chemistry give an imperfect and erroneous idea of the state of hydration of the sulphate of quinine of commerce.

The formula of the anhydrous sulphate of quinine is thus expressed :—

$$2(C_{40}H_{24}N_2O_4,HO),SO_3$$

The salt of this definite composition (which the authors have verified with great care) is not obtained in the drying ovens where the commercial sulphate of quinine is desiccated, but it may be always obtained by exposing the salt of commerce in glass tubes for five hours to a temperature of 120° Cent. The salt undergoes no alteration even if the temperature be raised to 155° Cent. Five different commercial samples of sulphate of quinine gave the following percentages of water :—

1	5·16	per cent.
2	5·71	,,
3	11·15	,,
4	11·79	,,
5	13·30	,,

The authors recommend that Pharmaceutists who consume large quantities of this expensive febrifuge should make known the amount of water they tolerate in it, and this figure admitted, the standard thus formed should be always appealed to, and the manufacturers controlled. They then show the large amount of water that may be introduced into the salt without altering its appearance. The commercial salt was submitted to repeated crystallization, and its purity established by analysis; it was then introduced into different atmospheres, each maintained in a particular hygrometric condition; for example, over sulphuric acid, either more or less concentrated or saturated with humidity, at temperatures varying from 15° to 18° Cent.

Placed over oil of vitriol, the sulphate of quinine undergoes but an incomplete desiccation, there yet remains a portion of water which is lost at 120° Cent.; three experiments determined this percentage of water at

1	4·64	per cent.
2	4·71	„
3	4·84	„
Mean	4·71	„

The desiccation does not proceed further if the temperature does not exceed 17° Cent.; but if this heat be exceeded, a further diminution of the percentage of water occurs. The air in which the salt was being dried over oil of vitriol having acquired a temperature of 30° Cent., the proportion of water in the salt was reduced to 0·93 per cent. It is presumed that the salt maintained at this temperature for one or two months might become anhydrous. Kept several days over sulphuric acid containing five equivalents of water, at a temperature below 15° Cent., the salt retained a quantity of water represented by the following numbers :—

1	5·84	per cent.
2	5·99	„
Mean	5·91	„

These conditions correspond to a tension of 2·674 m.m., and indicate a very dry atmosphere. Over sulphuric acid containing eighteen equivalents of water, at 15° Cent., corresponding to a hygrometric tension of 10·6 m.m., different samples of sulphate of quinine, containing from 10 to 18 per cent. of water, did not sensibly vary in weight.

If anhydrous sulphate of quinine, dried at 120° Cent., and commercial varieties be placed in a very humid atmosphere at 15° to 18° Cent., they progressively increase in weight. Under these circumstances the anhydrous salt took up, in five days, 28·77 per cent. of water.

Another sulphate of quinine containing 18 per cent. of water, and of which the weight did not vary when the salt was exposed over sulphuric acid containing eighteen equivalents of water, absorbed a further quantity of water, which in ten days amounted to 14 per cent., making a total of 32 per cent. of water finally contained in the salt. Another sample which, having been exposed to sulphuric acid containing five equivalents of water, only retained 5·91 per cent. of water, took up 33 per cent. more in eight days, making a total of 39 per cent. of water in the salt. Notwithstanding the great variations thus produced in the chemical and therapeutical value of sulphate of quinine, the appearance of the salt is not sensibly changed.

These experiments appear to show that the state of hydration of this salt is not definite or capable of expression in equivalents. This is a case not without its analogues. It is observed in several minerals, oolites particularly, where it is almost impossible to fractionize the water at different degrees of the thermometer, so as to express the quantity in a regular formula.

Whatever may be the value of these remarks in theory, they have an important practical bearing, showing, as they do, how large an amount of water may be contained in sulphate of quinine, otherwise pure, without altering sensibly its physical characteristics, of the presence of which, therefore, the appearance of the salt affords no indication.—*Répertoire de Chimie.*

DETECTION OF BEET SPIRIT IN SPIRIT OF WINE.

BY M. CABASSE.

The author states that the alcohol from beetroot assumes a roseate colour on the addition of sulphuric acid. When mixed with ordinary spirit of wine it may be thus detected, if in the proportion of one to three.

M. Cabasse employs one part of the acid to three parts of the spirit; but he does not state whether the sulphuric acid employed by him was pure, or contained nitrous acid.—*Répertoire de Chimie.*

ACTION OF NASCENT HYDROGEN ON CINNAMIC ACID.

BY MM. ERLENMEYER AND ALEXEJEFF.

When cinnamic acid is treated with sodium amalgam, a liquid is obtained, from which the addition of hydrochloric acid in excess separates a new acid in oily drops, which congeal on agitation. The composition of this acid is $C_{18}H_{12}O_4$, and it appears to be homologous with terebinthic acid, $C_{16}H_{10}O_4$, having also the same odour. The melting-point is 45° C., while that of turpentine acid is 90° C. It thus offers in its fusibility an anomaly, which has been before observed in the glycol series, in some of the members of which the volatility bears an inverse ratio to the equivalent.—*Chem. Centralblatt.*

ON POWDERED ALOES AND MYRRH.

BY M. WOLLWEBER.

Both aloes and myrrh are easily powdered in winter, but in summer these powders agglomerate sometimes to a solid mass. This inconvenience does not occur if the drugs have previously been exposed in the drying oven until they are spontaneously reduced to powder.—*Journal de Pharmacie.*

POWERFUL OXIDIZING MIXTURE.

BY M. BŒTTGER.

M. Bœttger calls attention to a remarkable property possessed by a mixture of oil of vitriol and permanganate of potash, which furnishes one of the most powerful oxidizers hitherto discovered.

Ether, alcohol, essential oils, and other inflammable substances, are fired by simple contact; sulphur is oxidized to sulphuric acid with a rustling noise. The mixture is prepared with two parts of permanganate of potash, and three parts of oil of vitriol. If a small portion be placed in a flask, the contained air is instantly ozonized.—*Tijdschrift voor Wetenschap. Pharmacie.*

THE CINNAMON GARDENS OF CEYLON.

The traveller who visits Colombo will scarcely fail to enter the cinnamon gardens, in order to enjoy the delightful, peculiar odour of the bark of this remarkable shrub, which plays such an important part in the history of Ceylon.

During the prosperous period of the cinnamon culture, the five largest cinnamon plantations on the south-western part of the island had a circumference of fifteen to twenty English miles. To a considerable degree all the other profitable productions of the island were neglected. The cultivation of cinnamon—a monopoly of the different governments which have successively ruled and plundered Ceylon and its inhabitants—was carried on particularly by the Dutch East India Company with barbarous rigour. The smallest theft of cinnamon, or intentional injury of the tree, was punished with death. For breaking off a branch, the penalty was cutting off the arm. Every plant which accidentally grew in the garden of a private citizen was the property of the government, and the cinnamon-gatherer or cinnamon-peeler had the right to collect its bark. To disturb such a plant—even though but to transplant it—was a crime to which life was a forfeit. The workmen who were engaged in collecting, peeling, and preparing the bark, belonged to the caste of the Chalias,—the lowest class. Even under the English rule, this monopoly of cinnamon, so injurious to trade, continued, until it was finally abolished in 1832, and the merchants of Colombo and Galle were able to participate in the trade of this important article of commerce, by paying an export duty of three shillings per pound. This tax, however, appeared much too high, since the selling price of the cinnamon in Europe was but six to seven shillings, and this advance in price stimulated foreign merchants to supply their wants

with other kinds of cinnamon—from the Laurus and Cassia—obtained in Cochin China and Java.

When finally the Government recovered from its delusion, and reduced the export duty to one shilling, and finally entirely relinquished it, the different substitutes for that cinnamon which appeared originally to belong to the Island of Ceylon* alone, as a natural monopoly, had already, on account of their much greater cheapness, found an entrance and sale in Europe, and the culture of the finer sorts became yearly less profitable. The price fell, and the consumption diminished. Only the inferior kinds paid for exportation; and, strange to say, these inferior and cheaper sorts now began to supplant the Cassia in the English market, as during the high prices of the monopoly the cheap Cassia had supplanted the much-esteemed true cinnamon. At the present time only 14,000 to 15,000 acres of land are under cultivation, most of which are in private hands; they yield annually from 800,000 to 900,000 pounds of cinnamon, worth from £40,000 to £50,000.

The Chalias are now no longer--as formerly under the Portuguese and Dutch—serfs or slaves attached to the soil, and liable to be sold with it, but free labourers, entitled to receive an adequate reward for their services.

The cinnamon gardens in the neighbourhood of Colombo, although for the most part in a decline, still give to the whole district an extraordinarily gay and lovely appearance. The shrubs, four to six feet high, with their delicate, beautifully green laurel-like leaves and light-yellow flower-stalks, set off by the snowy-white, sandy, alluvial soil in which they best flourish, appear doubly fresh and vigorous. The time of blooming is in January; the fruit ripens in April, when the plant is richest in sap. In May the peeling of the branches begins, and it lasts till October. The cutting and gathering of the shoots, one year old, and as thick as the thumb, is very troublesome, and requires many hands. Each workman cuts off as many branches as he can carry in one bundle, and then with the point of a curved knive skilfully loosens the bark from the wood, and with great care peels off the grey epidermis and bast tissue, and lays the stripped, parchment-like cinnamon in the sun, when it dries and rolls up. An uncommonly delicious, aromatic perfume hovers around the spot where the peeling of the bark is performed, like that exhaled on the breaking of a twig or a leaf. Whatever travellers, however, may relate of the odour of the groves as wafted to them at sea for a considerable distance, yet it would appear that this agreeable smell arises much more from other aromatic productions in which the island is so rich, than from the cinnamon, which yields it only to its immediate neighbourhood. The best kind of cinnamon is as thin as strong paper, delicate, brittle, of a fine golden-yellow colour, sweet, and spicy; the coarser sorts are thicker, of a darker brown colour, pungent, biting, and leaving in the mouth a bitter taste. In the storehouses the cinnamon is sorted, the quills placed inside of each other, packed in bundles of four feet in length, and sewed up in packages of ninety pounds' weight. In all the crevices and interstices of the package a considerably quantity of pepper is strewed, in order to preserve the cinnamon during the transportation, whereby both spices are improved. The black pepper attracts the excess of moisture, and refines the odour of the cinnamon.

In consequence of the decline of the cinnamon culture, attributable to the change of taste among the people, and thereby to the comparatively trifling consumption of the spice once so highly valued, the cultivation of coffee in Ceylon has increased tenfold in the last twenty years, and the want of labourers is the only cause that, with the remunerative profit it affords, it has not increased still more.—*American Journal of Pharmacy*, from *Vierteljahresschrift für praktische Pharmacie*.

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* Sir Emerson Tennent, however, in his work on Ceylon, disputes its being a native of this island. In no European or Asiatic author is mention made of cinnamon as a production or as an article of trade of Ceylon, until the end of the thirteenth century. Although in the earliest times it was introduced into Europe from Africa by way of Arabia, yet the merchants trading with the island first had knowledge of the appearance there of this valuable spice about the twelfth or thirteenth century. The learned author considers Africa as its native country.

ON MAUVE AND MAGENTA.

BY DR. A. W. HOFFMANN, F.R.S., PRES. C.S.

(*Lecture delivered at the Royal Institution of Great Britain, April* 11, 1862.)

The fact of the beautiful colouring matters known by these fanciful terms being substances derived from coal, must, I presume, be familiar to every one of you. But there may be many unacquainted with the means by which this transformation is accomplished. It is to them that I address myself this evening.

Coal, to become colour, has to pass through a series of stages of transition, each of which claims our attention for a moment. Briefly expressed, the aim of this address may be said to be, to show you the way from *coal* to *colour*. Now let me at once tell you this way is rather long; we may have to travel over country rough and intricate, and now and then to pass through territories which—I confess it with an appeal to the ladies—may not, perhaps, be altogether remarkable for their fragrance and sweetness. But on such occasions we shall accelerate our steps; and, on the whole, I venture to hope that we shall arrive at our journey's end without too much inconvenience.

Colour is intimately associated with light; without light there is no colour. This remark applies in a double sense to the colours derived from coal; for it is to the introduction of gas-light for illuminating our streets and houses, that we are indebted for the acquisition of these colours. This statement may appear strange, for nearly half a century has elapsed during which we have been in the possession of gas, whilst the transformation of coal into colouring matters has been achieved only recently under our own eyes. But you will immediately appreciate the truth of my assertion, if I tell you that these substances are obtained from a secondary product, generated in the manufacture of gas, a product long used for a variety of purposes, but which, only within the last few years, the researches of chemists have proved to be an inexhaustible mine of wealth and interest.

The starting point then for the production of Mauve and Magenta, is the manufacture of coal-gas; but this is so well known as not to need any detailed description. Let me briefly remind you of the principal features of the distillation of coal, by directing your attention to the two large diagrams representing the "retort house" and the "condensers" of a gas-work. You observe how the coal is heated in stupendous retorts, five or seven of which are generally associated in one furnace. The gas ascends from these retorts in vertical tubes, the bent ends of which dip into a large horizontal pipe, partly filled with water, called the *hydraulic main*, a considerable amount of the oily and tarry substances generated with the gas being separated by the water. The gas, so far purified, passes on through the condensers—immense vertical iron pipes constantly cooled by a current of cold water which surrounds their external surface. In these condensers an additional quantity of oily matter is separated, which, together with the oily substances deposited by the gas during its passage through the hydraulic main, is collected in appropriately placed cisterns. The gas, having traversed the condensers, passes through a series of further purifications before it is delivered into the mains of our streets; but these, unconnected as they are with our subject, must no longer occupy our attention.

The distillation of coal being the fundamental operation in the manufacture of Mauve and Magenta, it is but fair that it should not remain without an experimental illustration. In this tubulated retort of hard glass, I am heating fragments of coal. The beak of the retort is inserted into a three-necked glass globe, the lower neck of which terminates in a tube, communicating with a glass vessel for the collection of the "oily products;" while the third neck is provided with a delivery-tube for the discharge of the gas, which finds its way into a glass gas-holder. The coal has been heated only for a few minutes, and the gas already begins to be freely evolved; already I may light it at the orifice of the delivery-tube, which, for this purpose, I have removed from the gas-holder; already it burns with the characteristic luminous flame of coal-gas. In the meanwhile, you observe, a considerable quantity of the "oily products" has accumulated in the receiver. Their formation continues as long as the gas is evolved. Ultimately the coal is entirely resolved into *gas* and *oily products*, a non-volatile residue the *coke*, remaining behind in the retort.

It is in the oily products, the so-called "*coal-tar-oil*," that our interest is centred. To my mind this coal-tar-oil* is one of the most wonderful productions in the whole range of chemistry. That may be rather a one-sided view, but having in younger years spent much time in the investigation of this substance, I have acquired quite an affection for it. Nor can you fail to appreciate the interest which coal-tar presents to the chemist when you look at the diagram in which I have endeavoured to arrange synoptically the various substances which have been eliminated from it.

Products of the Destructive Distillation of Coal.

Name.	Formula.	Boiling Points.
Hydrogen	H H	
Marsh gas, or Hydride of Methyl	$C H_3,H$	
Hydride of Hexyl	C_6H_{13},H	
Hydride of Octyl	C_8H_{17},H	
Hydride of Decyl	$C_{10}H_{21},H$	
Olefiant gas, or Ethylene	C_2H_4	
Propylene, or Tetrylene	C_3H_6	
Caproylene, or Hexylene	C_6H_{12}	55°
Œnanthylene, or Heptylene	C_7H_{14}	
Paraffin	C_nH_{2n} (?)	
Acetylene	C_2H_2	
Benzol	C_6H_6	84°
Parabenzol	C_6H_6	
Toluol	C_7H_8	114°
Xylol	C_8H_{10}	126°
Cumol	C_9H_{12}	150°
Cymol	$C_{10}H_{14}$	175°
Naphthalin	$C_{10}H_8$	212°
Paranaphthalin, or Anthracen	$C_{14}H_{10}$	
Chrysen	$C_{12}H_4$ (?)	
Pyren	$C_{30}H_4$	
Eupion	(?)	
Water	$\left.\begin{matrix}H\\H\end{matrix}\right\}O$	100°
Hydrosulphuric acid	$\left.\begin{matrix}H\\H\end{matrix}\right\}S$	
Hydrosulphocyanic acid	$\left.\begin{matrix}H\\(C N)\end{matrix}\right\}S$	
Carbonic oxide	C O	
Carbonic anhydride	$C O_2$	
Disulphide of carbon	$C S_2$	47°
Sulphurous anhydride	$S O_2$	
Acetic acid	$\left.\begin{matrix}H\\(C_2H_3O)\end{matrix}\right\}O$	120°
Phenylic acid, or alcohol, *Phenol*	$\left.\begin{matrix}H\\(C_6H_5\end{matrix}\right\}O$	188°
Cresylic acid, or alcohol, Cresol	$\left.\begin{matrix}H\\(C_7H_7)\end{matrix}\right\}O$	203°
Phlorylic acid, or alcohol, Phlorol	$\left.\begin{matrix}H\\(C_8H_9)\end{matrix}\right\}O$	

* A large specimen of coal-tar-oil was here exhibited.

Products of the Destructive Distillation of Coal—continued.

Name.	Formula.	Boiling Points.
Rosolic acid		
Brunolic acid	(?)	
Ammonia	$\left.\begin{matrix}H\\H\\H\end{matrix}\right\}N$	182°
Aniline	$\left.\begin{matrix}C_6H_5\\H\\H\end{matrix}\right\}N$	96°
Cespitine	$(C_5H_{13})'''N$	115° 134° 154°
Pyridine	$(C_5H_5)'''N$	170°
Picoline	$(C_6H_7)'''N$	188°
Lutidine	$(C_7H_9)'''N$	211°
Collidine	$(C_8H_{11})'''N$	230°
Parvoline	$(C_9H_{13})'''N$	251°
Coridine	$(C_{10}H_{15})'''N$	
Rubidine	$(C_{11}H_{17})'''N$	235°
Viridine	$(C_{12}H_{19})'''N$	260°
Chinoline, or Leucoline	C_9H_7N	
Lepidine	$C_{10}H_9N$	
Cryptidine	$C_{11}H_{11}N$	
Pyrrol	C_4H_5N (?)	
Hydrocyanic acid	HCN	

This is rather a formidable list of compounds; their names, too, are not always remarkable for smoothness and melodious character, although, I should not omit to state, they are tame and domestic when compared with some of the terms which chemists of late have been under the painful necessity of inventing and inflicting. You need not be afraid, however, that I shall trouble you with many details about these substances. Most of them, though highly interesting for more than one reason, more especially when considered from a purely scientific point of view, are of no importance for our present subject, and need not therefore specially be noticed. In fact, the only coal-derivatives which, in connection with Mauve and Magenta, claim our attention, are *Benzol*, *Phenol*, and *Aniline*; those certainly we must by-and-by examine somewhat more in detail.

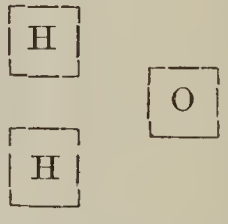
But before doing so, you legitimately expect that I should endeavour to give you some idea of the nature of the process, in which this endless variety of compounds is generated from coal. Were I to tell you simply that coal consists of *Carbon*, *Hydrogen*, *Nitrogen*, *Oxygen*, and *Sulphur*, not to mention the ash which is left after combustion, and that you may therefore look upon coal as a sort of magazine of these several elements, capable, under the influence of heat, of associating in an infinity of forms and proportions, you would have learnt comparatively little. Let me attempt to convey to you a somewhat more precise idea of the processes involved in the distillation of coal. For this purpose you must allow me to remind you of some of the general results elaborated by the researches of chemists during the last ten years, which, at the first glance, appear but little connected with Mauve and Magenta.

The infinite number of substances, mineral, vegetal, or animal, which form our

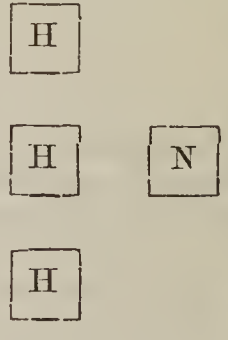
planet, variously as they are composed, may be referred—chemists now pretty generally agree—to a comparatively small number of *types of construction*. Opinions are divided respecting the actual number of these types, and even the choice of typical bodies is still a subject of discussion among chemists. But whatever the special views of particular schools be, the number of types is always small, and among them almost invariably figure *Hydrogen*, *Water*, and *Ammonia*. The comprehension of the meaning attached by chemists to the term *types* may perhaps be facilitated to you by a glance at three models which I have had constructed for this purpose, and which for the sake of convenience I may be allowed to designate as *type-moulds*.*

Chemists assume that the smallest particle of hydrogen, which exists in the free state, or, to use the chemical phrase, the molecule of hydrogen, consists of two atoms of hydrogen. The first of our type-moulds then, charged as it is with *one* atom (one volume) of hydrogen, associated with *another* atom (one volume) of hydrogen, represents the *molecule of hydrogen*.

In water, as you know, we have *two* atoms (two volumes) of hydrogen, associated with *one* atom (one volume) of oxygen.† You are reminded of this fact by our second type-mould, which represents the *molecule of water*.



In ammonia, lastly, you have *three* atoms (three volumes) of hydrogen, united with *one* atom (one volume) of nitrogen, a form of construction which is recorded in our third type-mould representing the *molecule of ammonia*.



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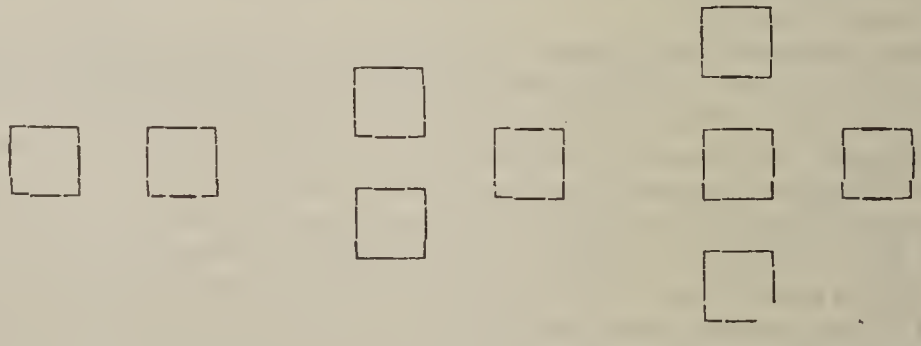
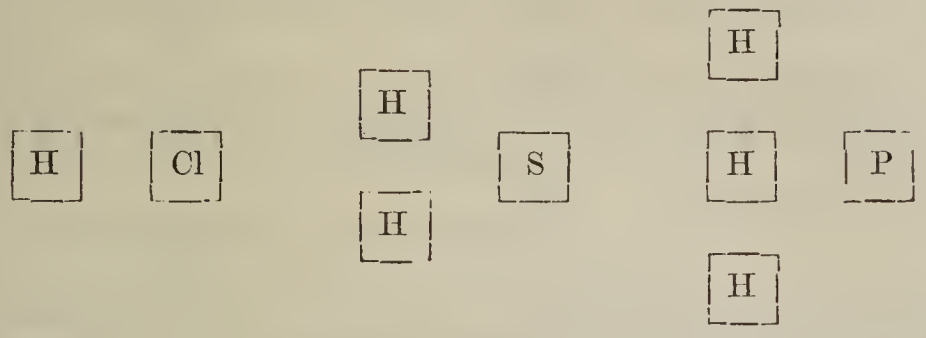
* These type-moulds consisted essentially of wire frames, presenting the outlines of cubes, associated, two, three, or four of them, in the manner indicated in the diagram—



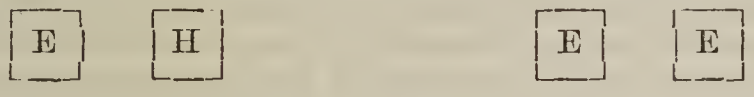
and capable of receiving zinc-cubes variously painted and marked, representing elementary and compound atoms.

† Equivalents used: H=1; O=16; S=32; C=12; N=Cl=33·5 etc.

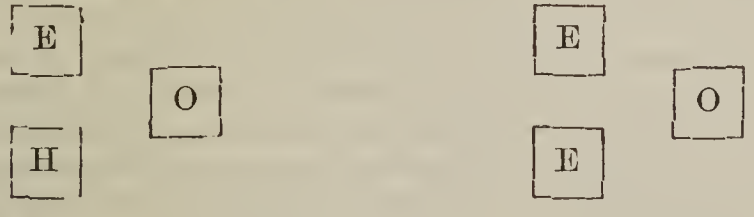
Nothing is easier now than to trace the derivation of other substances from hydrogen, from water, from ammonia. Let me remove from our three type-moulds one atom respectively of hydrogen, oxygen, and nitrogen, and fill the places thus vacated with atoms of chlorine, sulphur, and phosphorus, and I have, without giving you the slightest inconvenience, converted hydrogen into *hydrochloric acid*, water into *sulphuretted*, and ammonia into *phosphoretted hydrogen*.



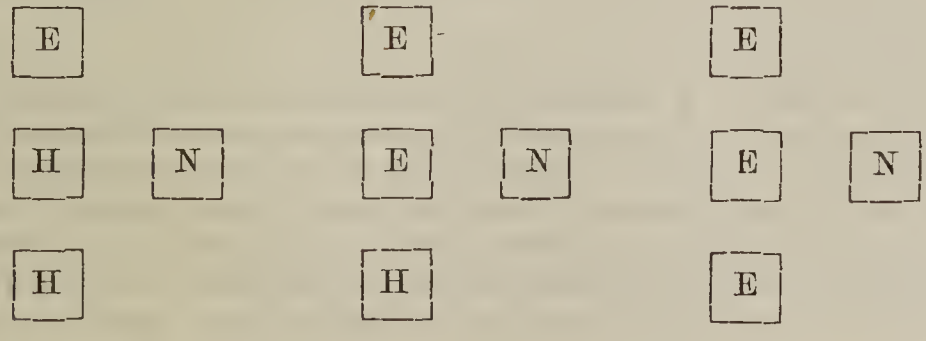
You observe the molecules of hydrochloric acid, of sulphuretted and phosphoretted hydrogen respectively, contain the same number of atoms which are present in the molecules of hydrogen, of water, and of ammonia. We have thus indicated that hydrochloric acid is constructed upon the hydrogen-type, sulphuretted hydrogen upon the water-type, phosphoretted hydrogen, lastly, upon the type of ammonia. The three bodies just considered were formed by the insertion of *elementary* atoms; but our type-moulds receive *compound* atoms with the same facility. Let me take as an illustration the compound atom *ethyl*, consisting of two atoms of carbon and five of hydrogen, (C_2H_5=E), which is familiar to the members of the Royal Institution. By inserting *one* or *two* ethyl-atoms into the hydrogen-mould I generate the molecules of *ethylated hydrogen*, or *ethylated ethyl* (free *ethyl*).



In a similar manner, by introducing either *one* or *two* ethyl-atoms into water, I convert the molecule of water into the molecules of the two *ethylated waters*, *alcohol* and *ether*.



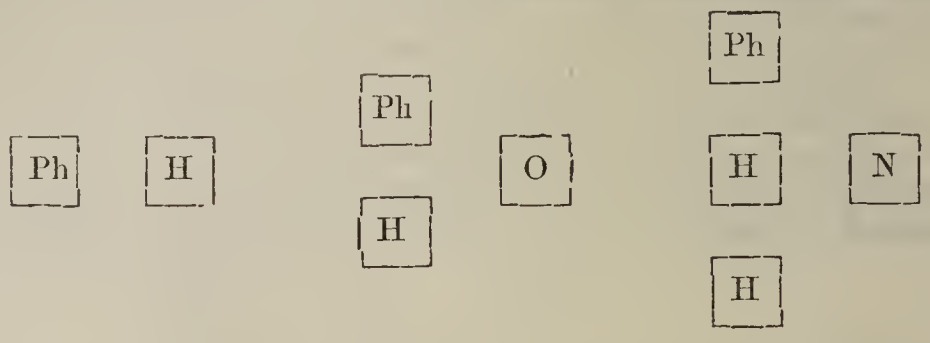
Displace, lastly, *one*, *two*, or *three* hydrogen-atoms in ammonia, by *one*, *two*, or *three* ethyl-atoms, and you give rise to the formation of the molecules of the three *ethylated ammonias*,



better known as *ethylamine*, *diethylamine*, and *triethylamine*.

At the risk of exhausting your patience, I repeat some of these changes with another

compound atom of a composition differing from that of ethyl. These mauve-coloured cubes may represent a compound atom, containing six atoms of carbon and five of hydrogen (C_6H_5=Ph), to which chemists have given the name of *phenyl*. Charge each of our type-moulds with an atom of phenyl, and you accomplish the construction of *phenylated hydrogen*, *phenylated water*, and *phenylated ammonia*,



substances better known as *benzol*, *phenol*, and *aniline*;* and the existence of which in coal-tar-oil I have already pointed out to you.

(*To be continued.*)

ACCIDENTAL POISONING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I looked forward to the appearance of the last number of your Journal with some interest, expecting to find in it an epitome of the evidence elicited during the sitting of the coroner's jury upon the body of Jane Gilhespie. Your article upon the subject, however, takes a somewhat different form, and there are one or two points upon which I feel tempted to comment.

You are studiedly merciful towards the unfortunate physician,—a point at which all must rejoice who, like ourselves, live in the daily risk of having similar accidents in our own establishments.

We pray that similar leniency may be shown by our medical brethren when such an accident occurs in the shop of a pharmaceutist.

It is not my purpose to discuss how far the certificate of the cause of death was justified by the symptoms which were, or ought to have been, observed previous to death. This is a subject for the medical journals.

Your mercy to the physician, however, seems to be seasoned with injustice to the jury and the analyst. Had the evidence which was given before the jury been placed before your readers, I think the most of them would have coincided with the jury in recommending greater caution; but this is a point upon which we may suspend our judgment till we are in possession of further evidence which may be adduced on either side of the question when the civil action is proceeded with.

The way in which you speak of the chemical evidence seems to imply a doubt of its validity. A medical friend of mine having expressed a doubt of the possibility of separating and weighing the strychnine from such a mixture as Mrs. Gilhespie had taken, induced me to try the experiment, and I obtained without difficulty a crop of clean crystals of strychnine fit for weighing, from so small a quantity as three grains of extract of nux vomica. But we will suppose you do not question the practicability of this process, which could present no great difficulties in the hands of any practical chemist, and

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* Large specimens of these three substances were exhibited upon the table.

pass on to the doubt which is more strongly implied in your manner when speaking of the examination of the viscera.

I think it would be much to be regretted if it got abroad that strychnine could not be detected in the body when little more than a grain had been taken, or a fortnight had elapsed between death and the analysis. To my mind Mr. Pattinson's evidence was all that could be desired, he having obtained both the colour indications and tetanic spasms from the contents of the stomach.

I am glad to hear that the best means of preventing accidental poisoning is still under consideration of the Committee. Like many others, I look with curiosity for the result of their deliberations.

BARNARD S. PROCTOR.

11, *Grey Street, Newcastle-on-Tyne, Dec.* 1862.

[We do not see that Mr. Proctor's note in any way affects the view taken in our last month's report of this case. The article alluded to was carefully drawn up after consideration of the voluminous verbatim reports in the local newspapers, and was intended chiefly as a review of those parts of the inquiry which affected Pharmaceutical Chemists as dispensers of medicines. We purposely avoided going into the chemical evidence, seeing no good reason for occupying space with it, and certainly never doubted that crystals of strychnia might be obtained from three grains of extract of nux vomica. We should be sorry to do injustice either to the analyst or the jury. After allowing the fairness of the verdict and its leniency under the circumstances, surely it was no *injustice* to add, "We should have liked to have seen greater pains taken in that part of the inquiry which related to the extent of precaution which had been adopted for the prevention of such accidents," and to follow it with our reasons for such a desire.]

THE OPIUM ROBBERY.

COURT OF EXCHEQUER, DECEMBER 8.—BEFORE THE LORD CHIEF BARON AND A SPECIAL JURY.

BOOR *v.* THE LONDON DOCKS.

Mr. Digby Seymour, Q.C., and Mr. Dowdeswell, were for the plaintiff; Mr. Giffard and Mr. J. P. Murphy appeared for the defendants.

The plaintiff is a wholesale chemist and druggist at Bishopsgate Street Within, and bought some parcels of opium, varying from 35 lb. to 45 lb. from a person named Dudley, who is since dead. He had also purchased a parcel of 32½ lb. from a person named Crane, a dealer in drugs, in 1861. Both these parcels had been put into boxes and forwarded to Mr. Lindo for sale,—the last on the 17th of July, 1861. On the 19th of July, Whicher, the detective, accompanied by a person named Robinson, called on the plaintiff and interrogated him as to where and from whom he obtained the last parcel. The plaintiff, it appeared, refused to tell—upon principle, as he said to-day. The officers took him to the office of the London Docks, where questions were put to him, but he still refused to give any information. The plaintiff commenced an action against Mr. Lindo to recover the cases of opium, when this issue was directed to be tried by a judge at chambers, and the plaintiff stated that the boxes contained parcels of opium which he had purchased from Dudley and Crane. Dudley, it appeared, occupied a small place, for which he paid 6s. a week, and had been, according to the statement of his widow, in the habit of dealing in opium. It appeared that a ship called the 'Brenda' had brought over a valuable cargo of 101 chests of opium, which, according to the opinion of Mr. Brooks, an opium broker, was of the finest kind, and in his judgment was identical with the chest of opium in question.

Mr. Horner, of Bucklersbury, who had purchased twenty-two chests of the opium

from the 'Brenda,' was also of opinion that the chest in dispute was of the same quality and description as the chests he had purchased. The cargo was very fine and uniform in its character, and also in the shape of the lump.

The defendants had been robbed of a part of the 'Brenda's' cargo, and it was contended that the opium in dispute formed a part of the stolen property.

The jury intimated that they entertained a very strong opinion in favour of the defendants, an opinion in which the Lord Chief Baron appeared to join; and a verdict was entered for the defendants.

LEEDS CHEMISTS' ASSOCIATION.*

A meeting of Chemists and Druggists, convened by Circular, was held in the Barristers' Room, at the Town Hall, Leeds, on Monday evening, December 22, 1862, when Mr. Harvey took the chair.

The following Resolutions were offered, discussed, and unanimously carried:—

"1. That a Society be now formed, to be called the 'Leeds Chemists' Association,' which shall be independent of any existing central Societies, and shall have for its objects the mutual improvement and general advancement of the interests of its members, and the better scientific education of its Assistants and Apprentices."

Proposed by Mr. Yewdall; seconded by Mr. Haigh.

"2. That the Association shall consist of Members, who shall subscribe the sum of 10*s.* annually; and of Associates (being Apprentices or Assistants), who shall subscribe 2*s.* 6*d.* annually; the subscriptions to be payable in advance."

Proposed by Mr. Reynolds; seconded by Mr. Stead.

"3. That the affairs of the Society be conducted by a Committee, to be elected by ballot annually by the Members, and consisting of a President, Treasurer, Secretary, and six other Members; three of the Committee to form a quorum."

Proposed by Mr. Thompson; seconded by Mr. Atkinson.

"4. That the Society shall meet monthly during the winter, when papers on scientific and other subjects of general interest to the body shall be read and discussed; and the Committee shall, as soon as possible, arrange for the delivery of Courses of Lectures on Chemistry, Pharmacy, Materia Medica, and Botany, for the attendance of which a small fee, independent of the subscription, shall be charged to defray necessary expenses."

Proposed by Mr. G. Ward; seconded by Mr. Abbott.

"5. That the following be the Committee and Officers for the ensuing year:—T. Harvey, Esq., *President;* J. Land, Esq., *Treasurer;* Mr. E. Yewdall, *Secretary;* Messrs. J. Abbott, E. Brown, G. Reinhardt, R. Reynolds, E. Thompson, G. Ward, *Committee.*"

Proposed by Mr. B. Taylor; seconded by Mr. Aldridge.

"6. That the Committee be instructed to prepare a Code of Rules, and submit the same to the first Meeting of the Association, to be held January 12, 1863."

Proposed by Mr. Walker; seconded by Mr. White.

The thanks of the meeting were then tendered to the chairman.

MISCELLANEA.

Yankee Pharmaceutical Humbug.—A New York druggist publishes a list of "concentrated tinctures" of American plants, which, presuming on the credulity of the profession, he offers with the following remarks:—

"CONCENTRATED TINCTURES.—These tinctures are amongst the greatest improve-

* This communication was received too late for insertion in its proper place.—ED.

ments in modern Pharmacy, and embrace the peculiar features for which our preparations have become so celebrated. They combine the essential qualities of definiteness, uniformity, and reliability. The *various proximate active principles are isolated singly, divested of all non-medicinal admixture, carefully estimated, and re-dissolved in alcohol in exact proportions.* Hence they resemble a definite solution of morphia, quinia, or any other definite vegetable alkaloid, and invariably represent a uniform amount of therapeutic power. They are *concentrated, definite solutions of the entire medicinal constituents of the plants from which they are severally derived.*"

Gun-Cotton as a Styptic.—In a letter ('Philadelphia Medical and Surgical Reporter') Dr. Gerard Arink recommends the use of gun-cotton as a styptic, and states that, in his own experience, it had answered the desired end immediately where all other stypties had failed; not only operating as a blood-stancher, but also as a tampoon, depressing arteries and veins, and as an antiseptic; it is remarkably efficacious in all cases of nasal and dental bleeding.

Unlawful Administration of Croton Oil and Jalap.—On Saturday, November 15th, an inquest was held at the 'Spread Eagle' Inn, Manchester Street, Oldham, on the body of James Davenport, who, it was alleged, died from the effects of croton oil and jalap mixed with his food, as a practical joke, by John Farrand. It appeared from the evidence that several men, James Davenport and John Farrand being of the party, agreed to have a dinner, which consisted of what is called "pluck" and liver, and that Farrand had procured from Mr. Massey, a druggist, in West Street, twopennyworth of jalap, and, according to Mr. Massey, two drops, but, as stated by Farrand, six drops of croton oil, and had mixed these with the food. John Farrand and Joseph Massey were formally committed for trial, but admitted to bail of £40 each, and sureties of £20 each.

Atropine Paper.—This paper is recommended by Mr. Streatfield, 'Ophthalmic Hospital Review,' as a portable and convenient substitute for the solution of atropine in ordinary use. It consists of green tissue paper, imbued with a solution of the sulphate of atropine so that a piece one-fifth of an inch square is equal to or contains as much of the salt as a drop, or minim, of the solution of a strength in ordinary use, two grains to the ounce. The paper, soaked in the strong solution, is hung up to dry, and turned about while drying, that the atropine may be equally distributed. The little piece of the paper to be used, of the size above indicated, is taken up on the tip of the forefinger, previously damped; and the patient's lower lid being drawn down, he is told to look upwards, and the scrap of paper is put on the sclerotic conjunction below the cornea almost without the knowledge of the patient; the lid is then let go, and the piece of paper is left between the ocular and palpebral conjunction; a handkerchief is then tied over the eye, that the lids may be kept closed for a while.

Cinchona succirubra.—Dr. Anderson, of the Calcutta Botanical Gardens, having succeeded in forming an infusion of the leaves of the cinchona succirubra from the plants of that species in the cinchona nursery, near Darjeeling, reports to Government that four cases of intermittent fever have been cured by it. The infusion thus possesses some of the febrifuge properties of cinchona. It is dark chocolate-colour, and is intensely bitter.—*Lancet, Dec.* 6.

The Transmission by Post of Seeds, Drugs, etc., to France.—Samples of seeds, drugs, etc., which cannot be sent in open covers must for the future be enclosed in bags made of linen, paper, or other material, tied at the neck with string. Closed transparent oiled-silk bags must no longer be used for this purpose, as the officers of the Post-Office in France are all instructed to treat packets of this description as letters, upon the ground that they are hermetically closed, and cannot be examined.—*Times.*

Citrate of Iron and Magnesia.—Dissolve in the solution of three ounces of citric acid, the hydrated sesquioxide of iron precipitated by ammonia from three and a quarter ounces of sulphate of iron (previously converted into sesquisulphate), and add carbonate of magnesia to saturation. The solution is best effected at a temperature of 150°. About one ounce of carbonate of magnesia is required for the saturation of the acid. Filter the solution, evaporate to the consistence of a thick syrup, and spread on glass to dry in scales.—*Dublin Medical Press.*

Galvanism, as a means of ascertaining the existence of a Bullet in a Wound.—The following method is the invention of Professor Favre, of Marseilles. "It consists in using a small pile, with two wires covered with india-rubber, one of which communicates with a galvanometer. Now if the two wires be introduced into a wound not containing an extraneous metallic body, the contact of the mere tissues, the bones, or pus, is insufficient to produce a current; but if the wires hit upon metal, the circuit is at once closed and the needle of the galvanometer deviates from its parallel position, and becomes perpendicular to the direction of the wire."—*Extract from Professor Nélaton's recent Lecture to his Pupils on Garibaldi's Wound.*

The Manufacture of Steel.—It is stated in the 'Army and Navy Gazette,' that Mr. Anderson, the Assistant-Superintendent of the Woolwich Arsenal, has discovered a simple process by which steel is rendered as tough as wrought iron, without losing its hardness. The change is effected in a few minutes, by heating the metal and plunging it in oil, after which the steel can be bent, but scarcely broken.

Pulvis Bismuthi Compositus.—Dr. Robert Druitt, in a communication to the 'Medical Times and Gazette' of December 6, on the use and dose of bismuth, gives the following formula:—Take Bismuthi Trisnitratis; Pulv. Acaciæ aa. gr. 480; Sodæ Bicarb. gr. 240; Zingiberis gr. 120 (vel Camphoræ Pulv. gr. 24); Saccharí Albi gr. 120. Fiat pulvis.—The above is intended for twenty-four doses. [This must not be confounded with the *Pulvis Bismuthi Compositus* of the *Skin Hospital Pharmacopœia*, which is a remedy for external application.—Ed. Pharm. Journ.]

Suicide by Essence of Bitter Almonds.—On Monday, December 8, Dr. Lankester held an inquest on the body of Constance Vanden Alleele, aged thirty-three. It appeared that the deceased had lived in the capacity of housekeeper, at No. 90, Newman Street, and on Thursday, December 4, she was found in her bedroom in violent convulsions, with a small bottle labelled "Essence of Almonds—Poison," by her side. Medical assistance was procured, but she died in about an hour. It was stated by one witness that deceased had been in a very depressed state of mind, and had proposed to witness that they should take poison together. Mr. Harding, surgeon, proved that death resulted from the hydrocyanic acid contained in the essence of almonds, and stated that the latter need not of necessity contain any hydrocyanic acid. Dr. Lankester concurred in the opinion expressed by Mr. Harding, and said there was no reason why any essence of almonds containing hydrocyanic acid should be sold, as it was easily deprived of that poison. Dr. Lankester observed that the chemist had marked "poison" on the bottle containing the essence; but probably it was that word which suggested to the deceased to make use of what she had purchased for a perfume, as a means of destroying life. The jury returned a verdict to the effect that deceased committed suicide by taking essence of bitter almonds while in an unsound state of mind.

Poisoning by Absorption.—In the 'Medical Times and Gazette' of December 6, Dr. Anstie relates a case of poisoning by the injection of three grains of morphia into the rectum, by mistake, when the usual symptoms of poisoning by opium came on. Twelve hours after the commencement of the symptoms, a scruple of caffeine was administered, with the effect of temporarily arousing the patient from the state of profound insensibility, which soon afterwards terminated in death.

Poisoning by Oil of Wormwood.—At a meeting of the Royal Medical and Chirurgical Society, November 25th, a case of poisoning by oil of wormwood was related by Mr. William Smith, surgeon to the Chesterfield Hospital. The quantity of the oil taken was about half an ounce, and the man was seen within a few minutes of swallowing it. The symptoms were those of a narcotico-acrid poison, affecting the brain, spinal system, and stomach. He was insensible, convulsed, and foaming at the mouth; he however recovered, under the use of emetics, combined with stimulants and demulcents. All remembrance of having taken the poison was completely wanting on recovery.

Alleged Poisoning by Arsenic.—On Monday, December 1, Mrs. Maria Edwin Cooke was brought up for re-examination before the Lord Mayor of York, on the

charge of having caused arsenic to be mixed with the flour used by the family of Mr. Cooke, an optician. The prisoner is the wife of Mr. Cooke's eldest son, and it was stated by the servant of the prisoner that her mistress had offered her £5 to mix something in her father-in-law's flour bin, but there was no evidence to prove that the accused was ever in possession of any arsenic, and the evidence of the servant was unsupported. It was stated by Mr. W. Reed, surgeon, of York, that he had attended the family on three distinct occasions, when they were suffering from the effects of poisoning by arsenic or some other irritant poison. It was also stated by Dr. Procter that he had found a considerable quantity of arsenic in the flour, and in the crust of a mince-pie, which he had analysed: but in the absence of any evidence against the prisoner she was discharged.

Alleged Death from Opium.—An inquest was held, October 24th, by Mr. H. Raffles Walthew, deputy coroner, in the Mile End Road, respecting the death of James Woodleigh, aged sixteen months. From the evidence of the mother of the child, it appeared that she took the child to Mr. Stimpson, a chemist in the Cambridge Road, who told her that the child was so emaciated that nothing would do him good. Mr. Stimpson, however, gave her some medicine to relieve the cough. A day or two afterwards she had some more medicine from Mr. Stimpson, who told her to give the child half a teaspoonful whenever he coughed (on the bottle, however, the direction was a teaspoonful). This medicine was administered several times, but the child getting worse, Dr. Irwin was called in; a few hours afterwards the child died. Dr. Irwin stated that the child had water on the brain, and that death resulted from acute hydrocephalus, which, in his opinion, was brought on by the opium contained in the medicine administered. Opium was an improper medicine in such a case. The inquiry was adjourned for the purpose of having the remainder of the medicine analysed.

REVIEW.

A Plain and Easy Account of British Fungi: with Descriptions of the Esculent and Poisonous Species, details of the Principles of Scientific Classification, and a Tabular Arrangement of Orders and Genera. By M. C. Cooke. With twenty-four coloured Plates. Robert Hardwicke, Piccadilly. 1862.

We gladly call the attention of our readers to the above work, as we are persuaded they will find in its pages much valuable and practical information upon the important and extremely interesting family to which it is devoted. The author is well known to all who take an interest in Economic Botany, as a persevering and pains-taking collector and investigator; he is one, moreover, who can write in a simple and readable manner, as the following quotation will show:—"To say that Fungi may be found everywhere, would not perhaps be literally true; but to say where they are *not* to be found, under any circumstances, would be puzzling. Not only are shady woods, mossy dells, secluded lanes, and green pastures, the habitats of fungi, but we meet with them in almost every situation where vegetable life is possible, and traces of them where it is not. Wherever decaying vegetable matter exists, we may expect to find a new race flourishing amid the *débris*. . . . . Every rotten stump or twig, every decaying leaf or fruit has its peculiar species, some large enough to attract immediate attention, others so small as to be invisible to the unaided eye. But we need not travel from home to meet with examples: the unwelcome dry-rot may have committed its ravages beneath our kitchen-floor or the walls of our cellars, and our casks or bottles of wine may be infested with members of this ubiquitous race. Can we find no morsel of bread or cheese upon which a mould is flourishing? no towel or other article of household linen presenting traces of mildew? Are we perfectly certain that all our preserves are unvisited, or, to come nearer to some of us, all our books untouched? But in places which many would consider more unlikely still, we may look for and expect to find fungi; on whitewashed walls, plaster ceilings, dirty glass, old

flannel, and old boots and shoes, or leather of any description; on carpets, mats, and boards; and even the plants in our herbaria must be watched against their ravages. Animals bear them about on their horns and hoofs, and the house-fly often carries in its body the vegetating fungus which ultimately deprives it of life. The yeast that is employed for fermenting our bread and our beer is a fungus, as well as the mildew and smut that infest our growing corn. . . . . Hop-mildew, vine-disease, turnip-mildew, bunt, smut, ergot, potato-murrain, pea and wheat mildew, may all be traced to them as the fertile source of mischief."

A small and cheap volume which should treat in a readable and simple manner of a family so ubiquitous, of such very variable properties, and of such general interest to us all, as the fungi, has long been a desideratum; and after a careful inspection of the present work we can cordially recommend it to our readers as supplying, in most respects at least, this admitted want.

TO CORRESPONDENTS.

R. A. P. S. (Sheffield).—The *President's and Register Fund Prizes.* (1) The competitor must be an apprentice or associate of the Society, and the papers must be lodged by the 1st of March, 1863, with the Secretary, in Edinburgh. (2) No subject is fixed, the writer can select his own, but it must be connected with chemistry or pharmacy. (3) The prizes consist of books. (4) There are no other prizes offered by the Edinburgh branch than the President's and Register Fund, while the conditions are the same for both.

J. K. (Bradford).—See our number for September, 1862, page 100: "Laws and Bye-Laws in Operation."

F. K. M. (Islington).—*Tinctura Ferri Peracetatis, Dublin Pharmacopœia.*

A Welshman (Cardiff).—Apply by letter to the Secretary, Navy Medical Department, Whitehall.

Juvenis (Bristol).—(1) Yes. (2) The citrate of iron and quinine is decomposed by the ammonia, and the quina thrown out.

J. W. (Scarborough) thinks it desirable to state in reference to the reply to a correspondent last month, that although *no* competitors appeared on the day appointed for the examination for the Pereira medal, *four* were eligible as candidates for it, but were prevented from attending on account of the day fixed, and the short notice given to them.

A. K. (Leamington).—*Kerosolene*, see page 261 of our last number.

A Major Associate (Paris).—There is no published formula for Dr. Collis Browne's *Chlorodyne.*

A Country Student (Boston).—The information required will be found in the regulations of the Board of Examiners, which will be forwarded on application by letter to the Secretary, 17, Bloomsbury Square.

J. M. (Crediton) and *F. K. Y.* (Birkenhead).—The use of the labels referred to does not require the Patent Medicine Stamp.

Mr. W. A. Sanger is thanked for his communication, which will receive attention.

Errata.—Page 206, foot-note, the following name was accidentally omitted from the list of Members of the Jury for Class II., Section B., International Exhibition:—

T. N. R. Morson, F.L.S., *London;* Pharmaceutical Chemist.

Line 21, for 'July Dictionary' read 'Jury Directory.'

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to the Secretary, Elias Bremridge, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. VIII.—FEBRUARY 1st, 1863.

THE METHYLATED SPIRIT QUESTION.

While ample testimony has been given of the satisfactory working of the laws and regulations relating to the use of methylated spirit in all its other applications, no such favourable statement can be made with reference to its use in pharmacy. In as far as it has hitherto been applied to the preparation of medicines, it cannot be said that it has effected, or is ever likely to effect, any good; but, on the contrary, its introduction as an article of the Materia Medica seems likely to prove in every way prejudicial to the best interests of those who prescribe, of those who dispense, and of those who seek the healing effects of medicine. It is much to be feared that unless some new regulations be adopted and enforced by the Government, great and irreparable injury will be inflicted upon the whole medical profession, including the department of pharmacy, throughout the country. Already the effects of the encouragement which has been given to the use of methylated spirit in medicine by the Army and Navy Boards, by medical men attached to hospitals and dispensaries, and by some medical men in their private practice, are beginning to be felt among the pharmaceutical body; and it is here, if the practice takes root, that it is likely to produce the most wide-spread, serious, and inveterate evils.

Methylated spirit is spirit of wine that has been defiled by the admixture of one-tenth its volume of imperfectly purified wood-naphtha. This addition is made in order to render the spirit so unpalatable and nauseous that it cannot be used as a beverage. The wood-naphtha, in the state in which it is used, is an indefinite mixture of methylic alcohol with variable quantities of noxious empyreumatic oils, which are produced by the destructive distillation of wood.

This being the character of methylated spirit, what must be the effect of using it as a substitute for pure spirit in the preparation of medicines? It is avowedly and purposely made permanently nauseous—too nauseous for the stomachs of those in health, and is it fit for the stomachs of those who, being out of health, are especially susceptible of any disturbing influence? The introduction of such a noxious compound,—containing the products of destructive distillation, one of the most offensive processes that the art of man has devised,—into the pure extractions of nature's health-restoring remedies, is an act of injustice and cruelty to the sick, against which the most active measures of suppression ought to be adopted.

That this was not considered to be a proper and legitimate use of methylated spirit, when measures for the introduction of that substance were under consideration, may be inferred from the following paragraph in the Report of the Chemical Commissioners to whom the subject was referred:—

"Spirit of wine," they say, "is used as a solvent and menstruum for administering the active constituents of animal and vegetable substances used in medicine in the form of tincture, spirit, etc. These preparations being intended for the treatment of disease, and their efficacy frequently depending upon the association of substances, which from long experience have been found to contribute to the required result, the unauthorized introduction into their composition of a new substance, and especially one of so marked a character as methylic spirit, cannot in any way be sanctioned. There is a large number of pharmaceutical preparations of the sort here referred to, most of which are made according to formulæ given in the Pharmacopœias, a strict compliance with which is enjoined upon those who compound them. We cannot recommend the substitution of any mixture for the pure spirit directed to be used in making these preparations."

But it is not merely the sick who will suffer from the introduction of methylated spirit into medicine. It is calculated to produce the most damaging influence upon the reputation, and in every way upon the interests of the whole body of chemists and druggists. What is the object of substituting methylated spirit for pure spirit? Not surely the production of a better product, for in no case will the product be better or even so good, and in most cases it will be greatly inferior to that obtained with pure spirit. The only conceivable object for the substitution is the saving effected through the difference in price. It is for this trumpery object that the interests of the sick are to be sacrificed; and who are to be the gainers from this saving of cost? If it all went to the pockets of the sick poor, it would be but an inadequate compensation for the injured health they would give in exchange for it. But is it necessary thus to cheapen physic even for the poor? Are there not abundant sources from which they can get their medicines, if requisite, for nothing? And if the saving goes not into the pockets of poor patients, which in many cases it doubtless will not, into whose pockets will it go? Shall the druggist reconcile his conscience to the lowering of the standard of purity in his medicines by thinking that he may share a pecuniary benefit between himself and his customers? If he should fall into this fatal fallacy, he will contribute to the infliction upon himself and his brethren of one of the greatest injuries with which the pharmaceutical body has ever been threatened.

No one has ever proposed, or probably ever thought of proposing, that methylated spirit should be generally used in the preparation of medicines. One man thinks it may be used for liniments and other external applications, but ought on no account to be administered internally. Another thinks it would not injuriously affect tincture of assafœtida, galbanum, or valerian, but would repudiate its use in tincture of rhubarb, spirit of salvolatile, or essence of ginger. Others again, ashamed to acknowledge that, for the sake of a little saving in the cost of materials, they had lowered the standard of purity, and declining therefore to admit that their preparations were methylated, may think that by a little purification (made part of the process) they can either wholly or partially substitute this cheap spirit for the more expensive, without its being detected.

How wide the field is here for ingenuity and speculation; how great the temptation for deception and fraud! The conscientious man, if he has duly considered and rightly reasoned upon all the circumstances of the case, will do all in his power to discourage the use of an impure and variable menstruum for the administration of medicines in which uniformity and purity are of the first importance. He cannot resort to a subterfuge, and he would not especially do so for the purpose of gaining increased profits or a pecuniary advantage over his brethren. But are there none who would resort to the use

of methylated spirit for gaining undue profits, or for taking unfair advantage of others in competition with their fellow-tradesmen? Let not even these, however, suppose that such practices would in the long run tend to their advantage. The ultimate result would be a general depreciation of drugs, and a general loss of character among druggists. Competition would bring exorbitant or unequal profits to a fair level, and if this comprised a general lowering of price in a large number of the more expensive medicines, the already small returns of a pharmaceutical establishment would be reduced to an amount that would yield no adequate remuneration for an educated man.

The introduction of methylated spirit into medicines, if allowed to gain ground,—while it would be a cruel imposition upon the sick, and a cause of debasement and ultimate loss to those who provide the remedies which the public use and the medical man prescribes,—would tend to destroy the efficacy of medical skill, and to retard the advancement of medical science. Is it not to the interest of the whole medical profession to unite together to put a stop to this insidious evil, which seeks to insinuate itself, with specious pretexts, into medical practice? The first appeal is on behalf of external applications, and then for nauseous internal remedies, and then for other remedies that are given in small quantities.

The wedge thus introduced will split open the heart of oak, and let in rottenness and corruption to the very core.

With earnestness we would appeal to the medical profession for that example and support, without which it will be vain to hope that the extension of the use of methylated spirit in medicine can be checked, much less its continuance suppressed. While the medical men attached to the Army and Navy sanction its use without any comprehensible pretext; while physicians and surgeons at hospitals and dispensaries make economy a plea for ordering methylated medicines; and while apothecaries admit these into their private practice, it is hopeless to look for the maintenance among chemists and druggists of that standard of purity and uniformity in medicines which it has been one of the objects of the Pharmaceutical Society to promote.

We appeal also to the members of the Pharmaceutical Society and to the readers of this Journal for their co-operation in carrying out the object contemplated at the recent pharmaceutical meeting, of which a report is given in our present number. We strongly recommend, however, in the discussion of the subject, that the question be viewed simply with reference to the interests of pharmacy and the practice of medicine, and that the interests of the public revenue be left to the Board of Inland Revenue. It is enough for us to know that the interests of our profession are deeply involved in the methylated spirit question, and that it behoves us to devise means, and speedily to adopt them, for remedying existing evils, and preventing the occurrence of more serious results which may follow a course of inaction.

LEEDS CHEMISTS' ASSOCIATION.

In another part of our journal will be found an inaugural address to the Leeds Chemists' Association, by its President, Mr. Harvey, which will be read with pleasure by all who desire the progress of pharmacy in Great Britain. We cannot too heartily express our satisfaction at the rise of local Societies of this character; and although we are not in possession of the *constitution* of the "Leeds Chemists' Association," we feel assured, regarding its President as the exponent of its principles as well as its leader, that it is of the right stamp. Time was, when a "Chemists' Association" was based merely on the

advantage of fixing a uniform "price list" for the district. That in the abstract might be unobjectionable, but it was always found, sooner or later, that trade would not be fettered by a tariff even in medicine, and on some extra-tension arising, a weak link would give way, and the bond of union was gone. In those days the "*status quo*" was regarded as all-sufficient, and it is not merely the experience of failures which has brought about the changes we witness; there is now a higher tone in our body; "*forward*" is the motto, and "*elevation*" is our watchword.

Other provincial capitals have established such institutions as we hope this Leeds Society will become; we constantly record the proceedings of one at Liverpool, and we would gladly see them working wherever there are sufficient dispensing chemists to maintain the spirit of the meetings. They exercise a salutary influence on all concerned in them. The examiners' report, read at the last annual meeting of our Society, stated that an advance in the acquirements of candidates for examination was apparent, and that not simply in those who had availed themselves of the advantages of the Society's laboratory, but of those also who came straight from the counter to the ordeal; and in this improvement the Pharmaceutical Society might fairly hail the fructification of the seed sown during twenty years of labour, and many thousands of pounds expenditure. It is not every chemist's assistant who is able to devote even one year to the prosecution of study alone, and these local associations will render him good service if he be inclined properly to add their advantages to those of his own practical occupation. We say "*practical occupation*" advisedly, for we believe the masters of apprentices now, without for a moment foregoing the neatness and order of "the shop," feel it incumbent on them—nay, even a positive pleasure, more fully "*to instruct in the knowledge and mysteries of the trade and science*" those who are committed to their teaching. With such a preparation, and perhaps two, three, or five months in the laboratory (and for these shorter periods we are glad to see the Council has of late thought fit to reduce the admission fee), a young man may well qualify himself to take his position as a Pharmaceutical chemist, not simply to claim the privileges, but also to uphold the dignity of his class.

THE BENEVOLENT FUND.

We publish this month a list of subscriptions to the Benevolent Fund, the perusal of which may serve to remind some of our members, when they are sending the annual subscription to the Secretary, of a means by which they may render this Fund more available as a provision against the effects of old age or adversity, to which all are liable. The formation of a Benevolent Fund was one of the objects originally contemplated on the establishment of the Pharmaceutical Society, and large sums were devoted to that purpose in the early years of our Association. That the Fund has received fewer and smaller contributions of late years than formerly, may no doubt be ascribed to the fact, that the attention of members has not been sufficiently directed to the subject, and not to any want of interest in so important an object. If members, generally, in transmitting their annual coutributions, were to add a trifle for the Benevolent Fund, the amount already invested might be greatly increased, so as to give a very important bearing and influence to this department of our Institution.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *January*, 7*th* 1863,

Present—Messrs. Bird, Bottle, Bucklee, Deane, George Edwards, Hanbury, Haselden, Hills, Lescher, Meggeson, Morson, Sandford, Squire, Standring, and Waugh, the following were elected

MEMBERS.

BRISTOL.....Jones, William Withers.
DEAL.....Green, John.
LEAMINGTON.....Cutting, James.
LONDON.....Sanger, William Albert.
LONDON.....Fisher, Francis Dixon.

The sum of £20 was granted from the Benevolent Fund to an aged widow of a Member.

AT A MEETING OF THE COUNCIL, *December* 3*rd*, 1862,

The Laboratory Fees were ordered to be reduced as follows:—One month, £4. 4*s.*; two months, £7. 7*s.*; three months, £10. 10*s.*

MAJOR EXAMINATION, *January* 21*st*, 1863.

Guesdon, Victor.....London.

MINOR EXAMINATION.

Bourdas, John.....London.
Guiot, Louis Edouard.....Mauritius.
Merle, Etienne Nemours.....Mauritius.
Wadsworth, Richard.....Preston.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Adams, William John	Mr. Uppleby	Leamington.
Armitage, Edmund Hewson	Mr. Hurst	Louth.
Basker, John Perkin	Mr. Heald	Sleaford.
Jones, Edward	Mr. Gibbs	Ryde, Isle of Wight.
Medd, Henry	Mr. Thurland	Oxford.
Slipper, Henry Howes	Mr. Slipper	London.

ERRATUM, page 289, omit the name of Wallis from the List of Registered Apprentices.

SUBSCRIBERS TO THE BENEVOLENT FUND, 1862.

	£	*s.*	*d.*
Arnold, Edward, Norwich	0	5	0
Attwood and Hugill, Messrs., 61, Cannon Street	1	1	0
Balmer, J., 94, St. John St. Rd.	1	1	0
Barnard, John, 338, Oxford St.	0	10	6
Best, John D., 28, Suffolk Street, Pall Mall	1	1	0
Blake, Sandford, and Blake, 47, Piccadilly	1	1	0
Bolton, Thos., Tenterden	0	5	0
Bond, John, Yarmouth	0	5	0
Bourdas, Isaiah, 10, Pont Street	0	10	6
Bradley, John, 21, Belgrave Road	0	10	6

	£	s.	d.
Brailey, Charles B., Heavitree	0	5	0
Cartwright, Wm., Newcastle-under-Lyne	0	10	6
Christopher, Wm., Crickhowell	0	5	0
Coles, J., New Rd., Camberwell	0	10	6
Cooper, George, Exeter	0	5	0
Chrispin, William, Hackney	0	10	0
Cupiss, Fras., Diss	0	10	6
Darby & Gosden, 140, Leadenhall Street	2	2	0
Davies, Charles, 11, Claremont Place, N., Brixton	0	5	0
Davies, Henry E., 43, Wood Street, City	0	10	6
Deane, Henry, Clapham	1	1	0
Eddy, Charles William, 30, Crown Street, Finsbury	1	1	0
Evans, John H., 60, Bartholomew Close	1	1	0
Fauleoner, Robert, Keen's Row, Walworth	1	1	0
Fox, William, 48, Church St., Bethnal Green	0	10	6
Gedge, Wm. S., 77, St. John St.	0	5	0
Goodbarne, Thomas, 13, Charles Place, Hoxton	0	10	6
Goodwin, John, Lower Clapton	0	10	6
Gristock, Thomas, 42, South St. Manchester Square	0	10	6
Haselden & Fisher, 18, Conduit Street	1	1	0
Hills, Thomas H., 338, Oxford Street	1	1	0
Hollier, Elliot, Dudley	0	10	6
Hooper, Bartlett, 43, King William Street	0	10	6
Hudson, W. B., 27, Haymarket	1	1	0
Hurst, Wm. T. H., Hempstead	0	5	0
Husband, Matthew, Exeter	0	5	0
Jackson, Thos., Manchester	0	10	6
Kernot, George, Poplar	0	5	0
Knight, John, Cambridge	0	10	6
Leseher, Joseph S., 60, Bartholomew Close	1	1	0
Mackay, John, Edinburgh	2	2	0
May, John, Battersea	0	10	6
Mercer, Nathan, Liverpool	0	10	6
Moore, James Lodge, 1, Craven Street, Westbourne Terrace	0	10	6
Nind, George, Wandsworth	0	10	6
Noakes, Richard, Brighton	0	10	6
Palk, John, Exeter	0	5	0
Penrose, Arthur W., 7, Amwell Street, Clerkenwell	0	5	0
Poeklington, James, Sydenham	0	10	0
Pollock, T., 129, Fenchurch St.	1	1	0
Powell, John, Shaftesbury	0	10	6
Pratt, John, Chichester	0	10	6
Proctor, William, Newcastle	1	1	0
Rankin, William, Kilmarnock	1	1	0
Rastrick, Joseph L., Southsea	0	5	0
Rea, Edward, 115, Wardour St.	1	1	0
Redfern, J., Ashby-de-la-Zouch	1	1	0
Robinson, James Mowld, Beverley	0	5	0
Parsons, William, Portsmouth	0	10	0
Savage, William D., Brighton.	0	10	6
Shirley, John George, 1, Westbourne Grove, Bayswater	0	10	6
Sims, John F., Hemingford Place, Barnsbury	0	5	0
Smith, Wm. Frederick, Keen's Row, Walworth	0	10	6
Spencer, Charles, Gravesend	1	1	0
Starkie, James, 4, Strand	1	1	0
Stone, John, Exeter	0	5	0
Tanner, Nicholas W., Exeter	0	5	0
Warner, Chas. H., Fore Street, City	1	1	0
White, Daniel, Park Terrace, Regent's Park	1	1	0

PHARMACEUTICAL MEETING.

Wednesday, January 7th, 1863.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society awarded to the respective donors thereof:—

The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.

The Photographic Journal.
The Technologist.
Répertoire de Chimie.
Pharmaceutisk Tidende.
Educational Times.
Rivista Pharmaceutica. From the respective Editors.
Journal of the Society of Arts.
Journal of the Proceedings of the Linnean Society.
Journal of the Chemical Society.
Bulletin de la Société Botanique de France. From the respective Societies.
Oil-Cake Controversy. By W. H. Harris.
Remarks on Oïdium, or Vine Disease. By John Mackay. From the Authors.
Specimen of Tragacanth *in situ* from Mr. A. Pertwee, Smyrna.
Sample of Waterproof Lint, possessing in one fabric all the properties, as a surgical dressing, of lint and oil-silk, from Messrs. Maw and Son.

The PRESIDENT announced that the Pereira Medal, open to competition among those Candidates who passed the Major Examination with honours in session 1860–61, had been awarded to Mr. William Albert Sanger.

The Medal awarded by the Juries for the Society's Collection of Drugs and Pharmaceutical Preparations at the International Exhibition was also placed on the table.

USE OF METHYLATED SPIRIT IN PHARMACY.

Mr. DEANE stated that he had received a letter from Mr. R. Reynolds, of Leeds, in which he expressed his regret that he was unable to attend the meeting at which this subject was discussed; but feeling a deep interest in the subject, Mr. Reynolds had sent the following written communication:—

Gentlemen,—I would willingly have come to town solely to be present this evening, but having resumed my Lectures at the School of Medicine, I cannot command my time.

I believe that the question as to how "Methylated Spirit" can influence Pharmacy, is the most important trade question that we have ever had to consider. So largely does alcohol enter into the composition of galenical remedies, and so large a part do these form of the whole used, that, taking the original cost of our existing Materia Medica, I estimate alcohol to amount to twenty per cent. of the whole.

Now, it must be borne in mind that the introduction of this spirit into pharmacy has not been devised as an improvement in any sense: its only object has been cheapness. That for some purposes, such as the preparation of liniments, etc., there would be no injury to the patient by the substitution of the methylated spirit, may be granted; but it is not upon any hypothetical case that I now ask the members of the Pharmaceutical Society to express an opinion.

During the past six months, our journal has monthly contained plain statements of facts regarding the use of methylated spirit in pharmacy. By these uncontradicted statements it is proved that an enormous quantity of this spirit is being used in pharmacy, under certain subterfuges, by which its nauseous character is greatly diminished, and it enters into ruinous competition with the pure, duty-paid spirit of the honest trader. The medicines supplied to the poor are now all but exclusively methylated. This compels chemists having that class as customers, to keep methylated preparations. An isolated individual of this class has no chance of effectively resisting the stream, but he must look to the power wielded by associations in his trade to protect him in pursuing a path of rectitude. The whole question turns upon

the degree to which methylated spirit can be purified. The Excise added naphtha to spirit of wine as a guarantee that it should be too nauseous to permit of being drank. Now the product is certainly so disgusting that no confusion between it and pure spirit could occur; but the manufacturing chemist gradually found that this spirit could be purified. I beg especially to disclaim any intention of entering into discussion as to whether methylated spirit can be re-converted into a spirit which will pass for pure *when unmixed*. Such questions may well be avoided as futile. The practical issue is, that the purification is so complete, that when even slightly flavoured additions are made to the spirit, it becomes indistinguishable from similar preparations made from pure spirit. Here are preparations made from such spirit. (No. 1 and 2.) If the identity of methylated spirit be thus lost, what guarantee can the purchaser have of the purity of any preparation which is capable of being so treated? The article of sweet spirit of nitre has afforded the chief field for the use of methylated spirit in pharmacy. It is known to the readers of the 'Pharmaceutical Journal' that the purified spirit passes current in trade under the disguise of containing a little spirit of nitre.

This spirit of nitre may be bought at 6*d*. per pound. When more purified, it fetches 10*d*.; again 1*s*. 6*d*.:—at 2*s*. it is a wonderfully close imitation of the pure article,—in fact, it cannot be distinguished from it, and is regularly substituted.

If the manufacturing chemists would tell what they know of the extent to which this displacement goes on, the members of the Society would stand aghast. Such of you as buy distilled spirits through ordinary wholesale druggists may fancy that the character of those houses secures you against these frauds. Nothing can be more fallacious. The wholesale druggist buys or barters these spirits from a few manufacturing chemists, who are the adepts at this transmutation of spirit. Amongst the manufacturing chemists practically supplying the whole country, there is hardly a name left of whom it can be said that they are not purifying methylated spirit. The profit to this class has been like that of the coiner or smuggler—all the larger, because of the uncertainty how long it would last.

I know of good evidence to show that one house, in the country, and by no means the largest in this trade, uses 12,000 gallons of methylated spirit medicinally per annum.

The impudent trash sold as Indian brandee, and gindee, and whiskee, is the offspring of methylated spirit. It is the cheap spirit of nitre, sweetened, coloured, and flavoured at pleasure. (Sample No. 3.) One chemist, in Lancashire, buys 1000 gallons of spirit of nitre at once for this compound.

The taint of methylated spirit has passed into British pharmacy, and already sunk deeply. There are too few whose hands are clean in this matter; for the temptation of using the methylated spirit for "just one thing" or "just a few things," has made many honourable men hesitate to lift up their voices against the interloper.

The public have been cheated hitherto: the chemist bought an article cheaply, and sold it at an extra profit; now the chemist is also cheated, because all confidence in the purity of spirits is destroyed, and the manufacturer is making the substitution. But presently the natural laws of competition will level all these circumstances, and then the retailer will find that in an article like medicine (where no cheapness stimulates the demand), that he sells for 4*d*. the spirituous preparation which used to be 1*s*. His *profits* will be found diminished in proportion. We are nursing a dangerous serpent when thus tampering with methylated spirit.

In order to protect our *real* and *permanent* trade interests, let us remove this anomalous condition,—this transition between purity and impurity. The

discoveries of modern science are assumed to have broken down the lines of demarcation between the animal and the vegetable kingdoms, and the ingenuity of manufacturing chemists has equally destroyed all distinction between pure and methylated preparations in pharmacy.

But I appeal to the members of the Pharmaceutical Society upon higher grounds than trade interest; our *duty* in this matter is plain. We owe allegiance to the College of Physicians, and they have expressly forbidden the use of methylated spirit; we owe allegiance, above all, to *truth*, and to the reputation of an honourable profession, which we are striving to elevate;—now, methylated spirit in pharmacy has become a gigantic *lie*. It forms a temptation to every honest chemist, from which we ought to deliver him. It says incessantly,—"See where you can substitute a gallon of methylated spirit for one of pure spirit, and pocket the 16*s*. per gallon of duty."

If we are still indisposed to move in the matter, let us have the common prudence to see that we can ensure ourselves against others exposing us. They are already doing so: see the 'Medical Times' of November 29th.

And why, Gentlemen, has this question received so very moderate an amount of consideration?

1stly. Because the Excise, having devised the methylated spirit system, will not voluntarily admit it to work badly. Further, the Excise are immense gainers by our losses; they gain immunity from the unpleasant task of prosecuting illicit distillers, because the talent formerly occupied upon illicit distillation is now devoted to "cleaning" methylated spirit. The Revenue suffers the same loss, it is true; but the Excise do not suffer the trouble. The merit of the case is one thing, whether it is provided for by official routine is another; and since no Excise official will be censured because methylated spirit is used in pharmacy, it is permitted to be used.

The second reason comes nearer home. It is because the Pharmaceutical Society has not spoken out on this matter. It is right that we should do this, and then that our executive, the Council, should express our views. I come now, Gentlemen, to the only part of this communication that I hesitate to write; but a sense of duty compels me to prefer the honour of my profession to inclination based on private friendships.

One-half of the members of the Council are interested, as manufacturing chemists or wholesale druggists, in the use, *the legitimate use usually*, of methylated spirit. To stir the question might result in the withdrawal of "the boon" from these legitimate purposes. Now, what is the position of a magistrate when called to adjudicate upon a case in which private interest and public duty clash? Certainly, to stand aside. There are members of the Council who are purely pharmaceutists, and whose views on this subject are as decided as my own. May you strengthen their hands by the expression of your opinion to-night, and save us from this "scandal to pharmacy," as Dr. Redwood truly calls it.

R. Reynolds.

Leeds, January 5th, 1863.

Mr. Deane, having concluded the reading of Mr. Reynolds's letter, said he was anxious to express his own opinion on this subject. The Government had granted a boon to manufacturers in permitting them to use spirit free of duty for manufacturing purposes; but he thought they had committed a great mistake in allowing methylated spirit to be employed in the manufacture of sweet spirit of nitre, and a still greater error in sanctioning its use in medicines to be employed by the Army and Navy. This was the thin end of the wedge, which had led to the more general use of methylated spirit in pharmacy. It was not to be wondered at, after the example set by the medical men attached to the army and navy, that those connected with public hospitals and dispen-

saries should adopt the same bad practice. Indeed, they had a greater excuse for doing so, being actuated by motives of economy; for these motives could hardly have entered into the account with the Army and Navy boards, who, in spending the money of the Government, would obviously save nothing by substituting duty-free for duty-paid spirit. He was sorry to find on inquiry that methylated spirit was largely used at hospitals and dispensaries for the preparation of medicines which ought only to be made with pure spirit. He feared that many medical men had been induced by these examples to use the same nauseous menstruum for some medicines in their private practice, especially among the poor, and druggists were thus called upon to supply methylated preparations. It was full time that the influence of the Pharmaceutical Society, as well as of the medical colleges, and even of the Government, should be exerted with the view of checking the abuses which were growing out of the unrestricted employment of methylated spirit. The application of scientific knowledge and manufacturing skill had resulted in the discovery of means by which a far greater amount of purification could be effected in methylated spirit than was thought possible when it was first introduced. The methylic contamination was to a great extent removed by processes of purification, and the spirit so purified, after being flavoured with essential oils and other substances, was available for use as a beverage, as the samples of Indian brandee and other similar cordials abundantly proved. He hoped the Government would be induced to interpose their authority, and put a stop to the employment of methylated spirit as a menstruum for the administration of medicines, whether for external or internal use, and at the same time protect the revenue from the frauds at present committed upon it.*

Mr. Haselden said,—I trust I may be permitted to add a few words upon this most important and interesting subject, affecting, as it does, or as I firmly believe it eventually will do, not only our trading interests, but also that which in my estimation is of far greater importance,—namely, our honour and commercial morality. It is perhaps scarcely necessary for me to remind you that the object contemplated by Government in granting the boon,—for unquestionably to some it has been a very great boon,—of using, free of duty, the methylated spirit for manufacturing purposes, was to place British and foreign manufacturers of certain articles upon an equal footing. This was a most liberal proceeding, and full of advantages and good intentions towards the public; but as all good actions are liable to misconstruction and perversion, so has it happened with this particular methylated spirit, and unfortunately the evil has fallen upon a class of men having already quite sufficient, in the exercise of their calling, to produce long faces and serious brows. In the first place, it never could have been intended that the nasty, disagreeable, I may almost be bold enough to say, disgusting compound, called methylated spirit, should be employed in the preparation of any pharmaceutical compounds or remedies, or it would never have been made so nauseous; and although the Excise may be heedless as to its employment in the methylic state, it is not with that body in this part of the consideration of our subject that we have to deal. The one point which we must keep steadfastly in our mind's eye is the honourable and moral bond of faith existing between the physician and surgeon who prescribes, the patient who takes, on the one hand, and the pharmaceutist who dispenses, on the other. It is this hitherto unimpaired faith between the contracting parties which has increased the number of prescribing,

* Since the meeting I have been informed by the Treasurer of the Society of Apothecaries, N. B. Ward, Esq., that they have never made or supplied the Government with medicines for *internal* use containing methylated spirit. It is only certain external applications that have been so prepared, and those at the request of the Government medical authorities.—*H. D.*

and diminished that of dispensing medical men; it is that faithful and honourable discharge of their duties as public servants, in conjunction with education, which has raised the pharmaceutists in the social scale, and given them a place, I hesitate not to say it, nearer that of a profession than any other class of trader. Should we ever be induced to sanction, or even wink at, the introduction of methylated spirit for pharmacopœia preparations, then farewell our honourable and moral bond of union, farewell professional faith in our honesty, farewell prestige, farewell public confidence,—the true pharmaceutist's occupation would be gone. But I am told this spirit can be cleaned and rectified, and is to all intents and purposes as good as the spirit ordered by the College of Physicians. This point I am not prepared to decide. It has been said by men of high chemical standing that it cannot be thoroughly deprived of methyl; on the other hand, I have seen some which I am sure would puzzle the most experienced. But before talking of this cleaned spirit comes the question once more—Is it lawful to clean? The answer is clear and distinct,—"No person whatever is allowed *to rectify or purify* methylated spirit for any purpose whatever." To do so is as great a fraud upon the Excise as smuggling or illicit distillation of any description, and the man who would do either has not that keen sense of moral rectitude and obligation that he ought to possess. It is, I think, quite clear that it is contrary to that faith due to the profession, and our duty to the public, to employ methylated spirit in the compounding of medicines, and it is equally contrary to the law to clean or rectify. But we are told that it is nevertheless done on a large scale, more particularly in the country, and that it militates greatly to the disadvantage of the honest man. To find a remedy, if possible, for this existing evil, appears to be the object of this meeting. As far as I can see, two ways only are open; namely, the prosecution by the Excise of the offending parties, or the withdrawal of the duty upon all spirit employed in pharmacy. With respect to the first, none of us, in order to its execution or performance, would like to turn common informer; neither does it appear to me to be exactly the province of the Council to fill a similar office; it is the duty of the Council to watch over the interests of the Society, and to obtain for its members all possible available information. With respect to the particular matter before us, the Council, in reply to questions, has ascertained that the College of Physicians entirely opposes the employment of methylated spirit in any of its preparations; the Excise gives the liberty to use it as such, but not to purify it; at the same time, from the questions put, there can, I think, be no doubt that the Excise is cognizant of the fact that methylated spirit is cleaned, and to a certain extent the revenue defrauded, just as much as it was aware that spirit of nitre was formerly prepared with illicitly distilled spirit; perhaps the time has not yet arrived for special notice to be taken of it by that department of the Government. One word now upon the allowance of the duty upon all spirit for medicinal or pharmaceutical purposes. In this practically I see looming in the distance difficulties equally great as those connected with methylated spirit. It might be a question with some whether, in the interests of our business, it would be an advantage to have spirit too cheap; whether it would not then be compulsory to supply medicines, in the composition or manufacture of which it forms a part, at a cheaper rate, and thus diminish the return, and consequently the profit, although the percentage might be as large; such a result should not happen, inasmuch as the mere cost of material ought not to be the chief consideration in a chemist's charge. But I see, or fancy that I do, much greater difficulties attached to the drawback upon spirit. Alas for human nature and the revenue! large quantities of this duty-freed spirit would, I fear, find its way into improper channels; and therefore I should pause before seriously suggesting or recommending the adoption of such a

course. After this, it will naturally be expected that I should suggest some remedy. It will not, I know, be sufficient that we here denounce the use of methylated spirit, or the cleaning of it for pharmacopœia preparations, and that the same be published in our Journal; but let the report of this meeting, so far as may be judicious, be published in the public papers; let a copy also be sent to the Excise department of the Inland Revenue; let these meetings, having the same object, be occasionally repeated; let similar meetings be held in the principal towns throughout the country, and thus let the expression of the country members be so collected and forwarded to the proper quarter; let all fresh facts relating to the question be brought forward, and, if possible, let the Excise be urged through their own officers, whose duty it is to find out the locality where any illicit purifying is carried on, and by their authority stop the same, and also fine any one having possession of such illicit product; for, bear in mind, if there was no demand there would be no supply: as much, or perhaps more, blame is attached to the consumer than the producer.

Mr. Whipple had been surprised to hear that methylated preparations were used as medicines in the Army and Navy. He believed those departments were supplied with medicines from Apothecaries' Hall, where medicines were supposed to be made with none but the best and purest materials. He had always believed implicitly in the purity of the medicines obtained from the Hall, and could hardly suppose that they would so far deviate from the instructions of the Pharmacopœia as to substitute methylated spirit for pure spirit. He looked upon methylated spirit as a poison, and believed that many deaths that had occurred in the administration of chloroform had resulted from the use of impure chloroform made from methylated spirit. Nothing, he thought, would more conspire to the injury of the Pharmaceutical Society than for its members to be found using methylated spirit in the preparation of their medicines. It was their duty to adhere strictly to the instructions of the Pharmacopœia; and if they did so, they certainly would not use methylated spirit.

Dr. Redwood wished to explain, with reference to the use of methylated spirit in medicines supplied to the Army and Navy, that it was only in liniments or preparations intended for external application that methylated spirit had been so employed. The subject had been referred to several years ago at one of their meetings,* and it was then stated, on the authority of a gentleman connected with the Hall, that certain preparations, intended for external use, having been ordered, some objection was at first urged at Apothecaries' Hall to the use of methylated spirit in such preparations; but they were told that the medical men who ordered them were responsible, and that their instructions were to be followed. In many other cases, including those of hospitals and dispensaries, the use of methylated spirit had been sanctioned by medical men in the preparation of certain medicines which they wished in this way to cheapen, and if such medicines were ordered to be prepared in that way by a druggist, of course, he had no alternative but to comply with the instructions given. He (Dr. R.) had always set his face against the use of methylated spirit in pharmacy, if intended as a vehicle or menstruum for the administration of medicines; but there were some purposes even in pharmacy to which it could be unobjectionably applied. Thus, for instance, it could be used for the manufacture of chloroform, and chloroform was produced from methylated spirit that was as good as that made from pure spirit. It could also be used for the manufacture of ether which, although not quite so pure as that made from pure spirit, was nevertheless sufficiently pure for

* See 'Pharmaceutical Journal,' vol. xvii. p. 265.

many phamaceutical purposes, such as making collodion. There was one application of methylated spirit, and one of the most extensive of its pharmaceutical applications, which he (Dr. R.) strongly objected to, but which was nevertheless sanctioned and even encouraged by the Excise authorities, and that was in the preparation of sweet spirit of nitre. The opinion originally entertained on this point by himself, and the other commissioners to whom the subject had been referred, was expressed in their report, from which he begged to read some extracts (see 'Pharmaceutical Journal,' vol. xiv. pp. 568, 569; and vol. xvi. p. 453). He still thought that the use of methylated spirit ought not to have been allowed for the manufacture of sweet spirit of nitre, but the Excise authorities had thought otherwise, and the Government and the Legislature had sanctioned its use for this and all other manufacturing purposes. The difficulty of dealing with the subject in a pharmaceutical point of view was thus greatly increased. He understood also, that since the free use of methylated spirit for all manufacturing purposes had been sanctioned by law, a new branch of pharmaceutical business had been opened up in some districts. In North Wales he was told, tincture of assafœtida was now sold to an extent formerly unknown. Assafœtida used to be largely consumed in the mountainous parts of Wales in the solid state; but now a cheap tincture, made with methylated spirit, had replaced it to such an extent, that a druggist in a small town would sometimes order a carboy or two of the tincture. The subject was thus becoming complicated, and great difficulties would be experienced now in any attempt to stop the use of methylated spirit in pharmacy.

Before resuming his seat, he wished to reply to some statements which had been made in the course of the discussion. Allusion had now and on other occasions been made to the purification of methylated spirit, and to injury which the revenue was supposed to sustain from the illegal use of purified methylated spirit. He had spoken on this subject on a former occasion, but must again repeat that, if by the purification of methylated spirit was meant the separation of the methylic alcohol, this had not yet been effected; and if it was merely meant that the empyreumatic oils which wood-naphtha usually contained were separated, this was always known to be practicable. He had seen no sample of so-called purified or cleaned methylated spirit that would be recognized in the trade as a potable spirit, and it would still justify the statement originally made by the Commissioners, who said in their report: "The conclusion from much investigation is, that the removal of wood-naphtha from the ten per cent. mixed spirit, and the restoration of its potability by any simple and economical process, is a most unlikely occurrence. We apprehend no danger whatever to the revenue from this source." He believed the Excise authorities were still prepared to adopt this conclusion, and to repeat the last sentence. But even if there were means known by which methylated spirit could be rendered potable, if they consisted of such complicated and elaborate means as the patented process of Mr. Eschwege, their adoption would be easily detected by the Excise, and, being illegal, would speedily be stopped. He was quite aware that a partial purification of methylated spirit, by the removal of the empyreumatic oils, had been effected, and that such spirit had been sold either alone or with some colourable addition; but he was informed at Somerset House that this trade no longer existed, and would not be permitted under the present Excise regulations. The purification of methylated spirit, as such, was illegal, and was strictly prohibited by the Excise officers. But while this was the case, every facility was afforded for the use of methylated spirit for legitimate manufacturing purposes, and when it was thus used, the manufacturer was permitted to produce the manufactured product in as great a state of excellence as was practicable. Thus

sweet spirit of nitre, being a manufactured product, and being considered to be a legitimate one, the manufacturer, in producing it, effected a purification of the spirit which rendered the product in some instances better than that which used to be made from illicit spirit.

The CHAIRMAN remarked that the Commissioners, in their report, had stated that good sweet spirit of nitre could not be obtained from methylated spirit, yet Dr. Redwood now said that it was better than when made from pure spirit: he would be glad to know how Dr. R. explained this.

Dr. REDWOOD said, that what he meant was that the best sweet spirit of nitre, produced with the greatest care from methylated spirit, such an article, for instance, as Mr. Reynolds referred to as being sold at two shillings a pound, was better than the very common article that used to be made from crude illicit spirit, and sold at about two shillings and fivepence a pound. This latter article was made from spirit produced on a small scale with very imperfect apparatus, in back-kitchens and cellars, by the illicit distillers. Such crude spirit was full of fusel oil, a substance as noxious as the impure wood-spirit that methylated spirit contained; and being converted into spirit of nitre with similarly imperfect arrangements, it was generally loaded with aldehyde, which was also a very noxious compound.

The CHAIRMAN inquired, whether in producing the better sort of spirit of nitre from methylated spirit, the spirit was not first purified before the spirit of nitre was formed?

Dr. REDWOOD said he thought it was: that a little nitric acid was first used to oxidize the empyreumatic oils, and thus to purify the spirit; but this was considered part of the process.

Mr. MEE thought the question of the ill effects of methylated spirit was one that ought to be left to medical men, and that they, as pharmaceutists, were probably raising an outcry unnecessarily, which might expose them to imputations that were not deserved.

Mr. STANDRING was decidedly opposed to the use of methylated spirit in medicine. The fact, that when it was originally ordered to be used in the Army and Navy its use was restricted to external applications, was a clear indication that the only object was economy, and that it was not considered fit for internal use. He thought the Government, if they wished to cheapen medicines, ought to allow the use of pure spirit duty free, and not first order it to be made unfit for use that they might afterwards have the trouble of purifying it. He thought a strongly-expressed opinion from that Society might induce the Government to alter the present unsatisfactory state of the law on this subject.

Mr. D. HANBURY thought methylated spirit, as an impure and variable substance, ought not to be used in medicine. The subject, in its present aspect, was beset with some difficulties, and he could not undertake to say what course would be the best to adopt with the view of checking the evils existing, or likely to arise from the use of methylated spirit. The subject called for continued watchfulness on the part of the Council.

Mr. HILLS was opposed to the use of methylated spirit in medicine under any form. Its introduction had no doubt been a boon to manufacturers, but they ought to resist its employment in any preparations used in medicine.

Mr. LONG expressed his decided objection to the use of any other than pure spirit in the preparation of medicines.

Mr. DEANE wished to remark, with reference to the cleaning or purification of methylated spirit, that although it was denied by Dr. Redwood that the cleaned spirit was sold as such, yet he virtually admitted that it could be, and was, purified. It might not be deprived of the methylic alcohol, but it certainly was freed, to a great extent, from the oils which gave it its peculiar and disgusting flavour.

The CHAIRMAN said the Pharmacopœia Committee of the Medical Council were strongly opposed to the use of methylated spirit, and objected even to its use in liniments, considering that, if it were allowed in such preparations, it would sometimes find its way into others. The College of Physicians had also expressed themselves to the same effect. He hoped that some good would result from the discussion of the subject that evening, and that some plan might be devised for preventing the evils which so many of their members anticipated from the use of methylated spirit in pharmacy.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Sixth General Meeting was held at the Royal Institution, on Thursday evening, December 18th, 1862; J. DUTTON, Esq., in the chair.

Mr. G. Hadfield was elected a member.

The following donations were announced:—To the library: the 'Chemist and Druggist,' for December, from the Proprietors; and the 'Chemist and Druggist Almanack.' To the museum: specimens of Gelatine from Messrs. Cox and Co., Gorgie Mills, Edinburgh; specimens of Horns of the Fallow Deer, Cort. Winteranus Verus, Cort. Alyxiæ, Cort. Pruni Virginiæ, Cort. Pareiræ, Cort. Laricis, Cort. Calilawan, Pakoe Kidang, Lignum Aloës Verum, Radix Actææ Racemosæ, Kamala, Labdanum, Lactucarium, Seeds of Strychnos Potatorum, and Sulphuret of Iron, from Messrs. Allen and Hanbury.

Mr. F. D. Delf exhibited his patent apparatus for preventing the escape of petroleum vapour from vessels containing that liquid. The principle of the invention is as follows:—The vessel holding the petroleum is fitted with a bent tube or siphon, one end of which dips into a layer of water at the bottom of the vessel, the other end of the tube dips into water contained in another vessel. In case of any expansion of the liquid by rise of temperature, any pressure is exerted upon the layer of water, a portion of which is forced up the tube; but neither any vapour nor liquid petroleum can escape, and as the liquid again contracts, the water resumes its former level.

The Secretary (Mr. Norman Tate) read a paper "On Milk and Cream, with special reference to the quality of those articles as supplied in Liverpool." He said that the average composition of pure milk was found by himself from the examination of a large number of samples he had procured in Lancashire, Cheshire, and Somersetshire, to be:—water, 86·83; butter, 3·97; casein, 4·01; sugar, 4·72; salts, 0·47. In these samples, the water varied from 84·75 to 87·6 per cent.; the butter from 3·12 to 4·94; the casein from 3·20 to 4·90; and the sugar from 3·70 to 5·70. After alluding to the several methods employed for the analysis of milk, he referred to the influence of different kinds of food, and of treatment upon both the quality and quantity of milk supplied by cows. The principal articles used in the adulteration of milk were enumerated, and the means of detecting them stated; but he considered no means so reliable as a complete chemical analysis, as the several methods frequently employed, such as taking the specific gravity, the use of the lactometer, lactoscope, etc., could not be depended upon. The average composition of milk in Liverpool, he had found to be:—water, 88·40; butter, 2·86; casein, 3·07; sugar, 5·20; and ash, 0·47. The water varied from 86·0 to 90·4; the butter from 1·05 to 4·0; casein from 1·87 to 3·64; sugar, from 4·02 to 8·20; and ash, from 0·25 to 0·64. Out of seventeen samples, ten contained an excess of water equal to an addition of from 8 to 25 per cent. of that fluid; but it did not necessarily follow that that quantity of water had been added, as an excess of water would appear if a portion of the cream had been abstracted. Two of the samples contained cane-sugar, but no other foreign ingredient was found. The results of the examination, compared with the results obtained from the test of samples of London and Dublin milk, showed that the milk of Liverpool was somewhat richer than the milk of the two former cities. As to the cream, the amount of real cream in

the samples varied from 15 to 48 per cent., and one sample contained starch. Some conversation followed the reading of the paper.

A vote of thanks to Mr. Tate, and to the donors to the library and museum, was passed.

On the motion of Mr. A. Redford, seconded by Mr. Charles Jones, a special vote of thanks was passed to Messrs. Allen and Hanbury, of London, for their handsome donation of seventeen specimens of drugs.

The Seventh Meeting of the Session was held at the Royal Institution, on Thursday the 15th of January, 1863; the President, J. Shaw, Esq., in the chair.

The following donations were announced:—To the library: the 'Technologist,' for January, from the editor; the 'Proceedings of the Liverpool Philomathic Society,' from the Society; and two copies of a paper by Mr. Nathan Mercer, "On the Methods employed for protecting the Bottoms of Ships," from the author. To the museum: a specimen of Petroleum Wax, from Mr. N. Mercer; and a sample of *Erythroxylon Coca*, from Messrs. Foulkes and Wallworth. A specimen of Petroleum from Africa was exhibited by Messrs. Holt and Banner.

Mr. N. Tate exhibited specimens of Canadian Petroleum deodorized by a process lately invented by himself.

Mr. W. H. Colby and Mr. W. Cleland made some remarks respecting the separation of sulphur compounds from coal-gas by means of oxide of iron.

Mr. A. Redford (the Vice-President) exhibited a fine collection of Alpine plants, and a beautiful sandal-wood fan from China; he also made some observations respecting the Bimeconate of Morphia.

Mr. Norman Tate then read a short paper on "The Leaves of the Erythroxylon Coca," in which he described their uses, chemical composition, and properties.

Mr. H. Bird said he was glad the subject had been brought before the Society, as he had been informed by a friend, who had brought a sample of the leaves from Peru, that they were used extensively in that country by the natives, and were found to possess such extraordinary virtues, that they could not be too highly spoken of, and he thought that they would soon become largely used in this country.

Mr. N. Mercer thought that the virtues of the Coca had been far too highly estimated, and that the properties ascribed to them were possessed by many other articles in quite as great a degree, as, for instance, tea, coffee, tobacco, wine, etc.

Mr. Tate said he concurred in the remarks of Mr. Mercer, as he believed the properties of the Coca had been much exaggerated.

Mr. Redford was of opinion that experiments should be made with the alkaloid of the Coca leaves, *cocaina*, as more reliable results were likely to be obtained.

After the usual votes of thanks the meeting separated.

LEEDS CHEMISTS' ASSOCIATION.

The first ordinary meeting of this Association was held at the Town Hall, on Monday evening, January 12th, 1863, when there was a large attendance.

The Committee brought up a draft of proposed Rules, which were discussed and settled.

The President, J. Harvey, Esq., then proceeded to deliver his Inaugural Address, of which the following is an abstract:—

In offering a few remarks on the occasion of our setting on foot the Leeds Chemists' Association, I shall wish to be as plain and practical as possible. I will endeavour to describe what it is that we desire to effect by the new Society; what are the means we purpose to employ; and the results we hope and expect to realize. The promoters of the movement must, I think, have felt encouraged by the character and tone of our preliminary meeting, held on the 22nd ult. It was not only marked by unanimity, but by a very intelligent appreciation of the proposed object. If it were in my power to gather up the various hints and suggestions that were spontaneously made in the conversational discussion of that evening, my present task would be easy; and, in fact,

I scarcely expect to employ any statement or argument to night, which was not either expressed or alluded to by one or other of the gentlemen who took part in our former meeting.

Reference was made on that occasion to the combinations that have sprung up among the members of our calling within the last twenty years :—the Pharmaceutical Society, the United Society and the various local associations; we shall probably all admit that the formation of these Societies is a sign of the times,—a token that a want has been felt, which individual, unassisted effort cannot supply. This need of association arises from the fact that ours is not a mere trade. It might be presumptuous to call it a profession, yet it evidently joins on to a profession. It demands the habits of business of the merchant and tradesman; but it demands also some knowledge of the learned and other languages, and no small amount of scientific training, the more exact and thorough the better. Now in all professions, *association*, in some shape or other, for the purposes of mutual improvement, is found to be a necessity. The advance of science, especially in its practical applications, is so extraordinarily rapid, that we need all possible aid to enable us to keep pace with it; and it has been found by experience that as solitary study is the most laborious, so associated investigation and mutual instruction are the readiest and most agreeable means of adding to our stores of knowledge. Let me illustrate this point by a case that will shortly occur (I am indebted for the hint to Mr. Haigh). We are expecting a new pharmacopœia. It will be the first *British* pharmacopœia, stamped with the united authority of the medical faculties of London, Edinburgh, and Dublin. There can be no doubt it will make great changes in the materia medica, and in the formulas; and it is expected to introduce a new system of weights, in place of that with which we have been so long familiar. Now if each of us has to take this new pharmacopœia and get thoroughly conversant with it by private study, we shall find it a very dry and difficult task; but if the volume is made the subject of explanation and discussion at one or more of our proposed monthly meetings, we shall gain our object, not only in a much more agreeable way, but in a mode in which the necessary information will be far more accurately impressed on the mind.

The conclusion then which I am anxious to enforce is this,—that to advance with the times, and to maintain our knowledge of the science of our calling abreast with the requirements of the day, we *must* combine for the mutual interchange of thought and knowledge. We cannot, if we would, get rid of that part of our vocation which is scientific, and therefore professional. Should we determine to become mere traders, we should certainly fail and sink to the position of hucksters; but the true honour, dignity, and profit of our calling is to embrace it, as it is, with all its difficult requirements, and to do our best by mutual aid to rise to a level with the responsibilities that devolve upon us, through the dependence both of the medical profession and the public on our accuracy and conscientiousness.

We ought not to be much discouraged by the fact that many of the provincial associations of chemists have either died out, or failed to maintain an active and healthy existence. Not the less were they an attempt to supply an admitted want; and as the want still exists, and will increase in urgency, it is probable these dormant associations will be roused again into life and activity. They may have failed from attempting too much at first. This is an error we shall endeavour to avoid. A monthly meeting during the winter for papers and discussions; two or three short courses of lectures for the education of the juniors; and an attempt which, I trust, will be made, to found a small but useful library—these are surely modest aims! Is it unreasonable to expect that we shall succeed in them? A museum seems at present unattainable, but we have reason to hope that the want of it may in some degree be supplied by the "Industrial Museum" about to be formed in their new and beautiful hall by the Council of the Leeds Philosophical Society. Now, if we prosper in our design to the extent of our present aims, it is quite conceivable that our humble association might grow into something like an institution,—in fact, into a School of Pharmacy, bearing the same relation to our calling in the West Riding and the North, that the Leeds School of Medicine (generally admitted, I believe, to be one of the first provincial schools) does to the medical profession.

At our former meeting the hint was thrown out that the Pharmaceutical Society—

(one day perhaps to be invigorated and enlarged, by having its basis widened and its constituency extended)—would see the necessity of instituting provincial examinations for the minor or associates' diploma. Whenever this shall come to pass, Leeds will be in a position to prefer its claim to be one of the provincial centres; what I will venture to call the metropolitan character of our town in the north of England, its growing relative importance in all social aspects, will naturally entitle it to this distinction.

In most countries the professional education required to make a competent pharmaceutist is *compulsory;* the State demands it, and makes more or less provision for its supply. There is this grand difference running between British and Continental arrangements in matters educational,—the latter are compulsory, while with us, all is left to voluntary zeal. Now, while we may believe that a higher style of national and individual character results from our greater independence of action, yet it must be admitted that whatever we gain is purchased at a considerable price. Some of the greatest authorities among our scientific men believe that we are falling behind several of the continental nations in science; and what is of far more consequence to us, that we are losing our grand pre-eminence in manufactures; that, in short, while *we* are making progress, our continental competitors are improving at a faster rate, and bringing more science and more taste, the result of better educational training, to bear on their several branches of manufacturing industry. However this may be, with reference to our particular calling, we are bound in all propriety to do our best to maintain as high a standard of knowledge by voluntary effort, as our French and German brethren are compelled to reach by less spontaneous means.

In a lecture delivered by the late lamented Dr. George Wilson, before the Edinburgh Pharmaceutical Association, I find it stated that "the French *Pharmacien* is much more than merely a drug-chemist; he is learned in the botanical, zoological, physiological, and medical relations of pharmacy." The same high authority informs us that the pharmaceutist in this country "to the community at large occupies the position of one who can supply them on demand with every attainable known drug or medicine in a state of integrity and purity. To the medical profession he stands in the same relation as the smith does to the soldier, the carpenter to the sailor, or the cutler to the surgeon. The chemist supplies the physician with the weapons of his calling; and in addition, the practitioner often looks to him for suggestions as to what he should give, and how he should mingle and administer it. The pharmacologist must thus, not only like other professional men keep abreast with the general public, but he must follow the pace of its medical section, and be ready at all times to co-operate intelligently with practitioners of medicine."

We shall do well to keep in view the definition of our calling and its requirements, thus presented to us by a very competent authority.

The President then proceeded to point out the rapid progress which has been made in the advancement of chemical science and its applications during the last thirty-five years, to which his experience applied. He referred especially to the development of the manufacture of alkali from common salt, the production of amorphous phosphorus, and its use in making matches, the production of the fatty acids and glycerine from common fats, the use of the former in making candles, and of the latter in pharmacy, the separation of paraffin from the distilled products of peat, and other allied substances, and the use of this in the formation of the most perfect of candles, the more recent production of the rock-oils of America, and of dyes from coal-tar, together with other important discoveries and applications.

If, he said, chemistry is thus important in reference to the general industry of the country; if it is effecting such vast changes and development in almost every branch of manufacture, so that nearly every man who assumes to be trained and educated for usefulness. must be acquainted with it, can we alone afford to neglect it? Or to pick up just so much of chemical knowledge as we can scarcely fail to do now-a-days in the ordinary intercourse of life, and the reading of newspapers and periodicals? For, be it remarked, popular chemistry has become one of the spices of our light literature.

Having referred to the importance of chemistry, and also botany, as branches of study for the chemist and druggist, which the existing state of medical practice and the increasing information of the public upon these subjects rendered more than ever

necessary, Mr. Harvey pointed out some of the new applications that had arisen for chemical knowledge, which provincial chemists might profitably turn to account, in the analysis of artificial manures, and the detection of adulterations in food and medicines. He then proceeded as follows:—

It may be desirable to give a few moments to the consideration of what an association like this ought *not* to attempt to do. It ought not, I conceive, to attempt to regulate prices, or hours of business, or even to pronounce *dicta* on questions of trade morality. Customers who beat down prices often haunt the shops of new-beginners, and their report of prices paid elsewhere would generally on inquiry be found to belong to the region of invention. There are other subjects upon which it would be unwise for us to legislate, so to speak, which might yet be very suitably discussed among us. There could be no objection, I conceive, to a member giving us his views on the "methylated spirit" question, its several bearings, scientific, medical, and moral, leaving such conclusions as might be reached to work their own results in our practice as pharmaceutists.

We can scarcely meet for the proper objects of our association without increasing the good feeling and mutual respect which I am happy to believe already exists among us to a gratifying degree, and this will imperceptibly tend to promote uniformity in our business arrangements, so far as that is practicable and desirable; it will raise the tone of feeling in regard to correct trade practice, and will tend to abolish irregularities, which in some cases may arise more from imperfect knowledge or bad training than from any want of conscientiousness. It is of course, probable, that emergencies may arise calling for united energetic action, such as the introduction of some bill into Parliament seriously affecting our interests; in such a case, we should find the advantage of an organization that would enable us to act promptly and unitedly.

I must now advert to what I feel to be one of the most important features of our programme,—the establishment of short elementary courses of lectures for our young men and apprentices. Will they be supported by an adequate attendance? The eighty-seven chemists' establishments of Leeds ought to supply students in sufficient number. Much will depend on the encouragement we ourselves may give, and surely this will not be wanting. As regards our apprentices, we have covenanted under our hand and seal to teach and instruct them: can we discharge this duty more effectually, or with less personal labour, than by promoting their attendance at these classes? It is a happy circumstance that we possess in the chemical classes of the Leeds Mechanics' Institute, conducted by one of our members, Mr. Ward, an admirable means of supplying this essential educational necessity. The pupils of my own firm have in succession joined this valuable class from its first formation under my friend Mr. Huggon; and several of them have greatly profited by the thoroughly practical instruction then, and still, imparted in these classes. Having, then, a chemical class ready formed, and conducted by one of our members who is willing and desirous to co-operate with us, we are called upon to furnish sound practical instruction in botany, materia medica, and pharmacy. I believe there are gentlemen present who are both capable and willing to conduct classes in these subjects.

Among other results of the Leeds School of Medicine is this,—that it gives our medical men the pick of the county for pupils and assistants. It would be premature to anticipate that our modest classes would produce a like effect; and yet, so far as they did real work, they would obviously tend to such a result. We should not only attract young men of more than the average capacity, diligence, and love of their vocation, but we should raise the qualification of those already in our service. I may appeal to the masters present whether there is not a real need of such a school for our younger friends. Few men have more cause to be thankful for good and valuable service from assistants and apprentices than myself; but the most valued assistant does not remain always, and when he leaves, his place is rarely supplied without failures and disappointments, perhaps a succession of them. When smarting under this kind of experience, one is tempted to question whether the competency, the attainments, and the moral tone of the mass of young men from which the employer who is in want of an assistant must make his choice, are such as they might be, and ought to be.

To the pupils themselves, one would be glad to point out that any time wasted and lost during apprenticeship can never be fully recovered, and that bad habits indulged

will leave their scars and stings. I once made a three or four days' voyage in a steamer; the loss of an hour at starting, from some trifling derangement in the machinery, cost twelve hours' delay at the other end. So in life, the loss of an hour at seed-time is the loss of days in harvest. And in reference to our special calling, apprenticeship is the seed-time. It would be very difficult to estimate even the money value (the lowest kind of value) to a young man of good manners, good attainments, good habits of business, and good character. It is well, too, that we should point out to our pupils that for one of them to gain sound practical knowledge of chemistry is to add another string to his bow. Should a young man well furnished with this knowledge find no suitable opening in his own business, look how many other alternatives are open to him! How many trades and manufactures are now carried on in the country, and the number is increasing every day, that require the services of trained practical chemists. The opinion is entertained by some that the training of a chemist and druggist, beginning with drudgery and dusting, and ending in scientific culture, but requiring, from first to last, care, and method, and thought, imparts a more valuable education for many important positions in life than is to be obtained elsewhere. Hence, it would seem, we see a large proportion, about one-third, of the young men who pass the major examination of the Pharmaceutical Society, quit our ranks and enter into other occupations. It is fair to presume they are attracted to other fields of labour by the demand for the kind of knowledge and skill they possess. It was stated in 1851, by Dr. Lyon Playfair, that our manufacturers even resorted to France in quest of young men trained in schools where chemistry was effectively taught.

Before concluding my address, which I fear has already occupied too much of your time, may I be allowed to offer a thought or two on a topic already glanced at,—the moral tone of our professional and commercial practice. When reading some time ago the memoir of the celebrated German bookseller, Perthes, I was much struck with the following remarks:—"Perthes had observed that, where a bookseller possessed an educated taste, works of a high class were in demand; and that when, on the other hand, the bookseller was a man of low taste and habits, a licentious and worthless literature had a wide circulation. Supported by these facts, Perthes ascribed to the book-trade in general, and to each individual bookseller, an important influence on the direction in which the public mind sought its mental food; and clearly perceiving the influence of literature upon thought and life, he was convinced, both then and throughout his whole life, that the book-trade, and the manner in which it was conducted, had a most important part to play in giving direction to the course of events."

Now, to a greater or less extent, the spirit of this passage is applicable to all trades and callings, and among the rest to ours. We may sometimes have the opportunity of discouraging the improper use of opiates. In some cases the pernicious habit of opium-taking has grown out of the necessity, real or fancied, of using opiates for the relief of pain. The chemist can warn an incautious customer of his danger. In other cases he would, I conceive, be fully warranted in refusing to sell opiates, when it is plain they are used habitually and improperly. Among the poor, the use of opiate anodynes for their teething children may often be quietly but effectually discouraged, and the customer persuaded to try much better and safer means. While offering these remarks on opiates, I feel bound to add, that if my own experience is any criterion, the use of opiates is very much less among our population than it is supposed to be in many other places.

One word in conclusion. It will perhaps have been noticed that in what I have said on behalf of scientific improvement, and upon the subjects suitable for discussion at our proposed monthly meetings, I have laid little stress on abstract science as distinguished from science in its applications. The reason has simply been that I have felt myself entirely unqualified to set forth in fitting terms the superior importance and higher interest of the former. Should any paper or lecture be offered to us on any part of chemical or botanical science which may seem to have no immediate connection with our daily occupation, I trust we should not only accept the subject, but honour the member who could thus prove his devotion to scientific truth for its own sake. When the claims of abstract and applied science come into competition, we must give the place of honour to the former, on the plain ground that the mistress is of higher station than her handmaid, and the parent than the child.

The hearty thanks of the meeting were tendered to the President for his address, and he was requested to allow it to be printed *in extenso*.

The Association has enrolled about seventy Members and Associates.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., ETC.

(*Continued from p.* 302.)

VIII. DICENTRA (CORYDALIS) FORMOSA, *BORKH.*—TURKEY CORN.

History.—Under the common names of Turkey Corn, Turkey Pea, etc., the tuber, or, as it is improperly termed, the root, of this plant, has for several years been employed by the Eclectics as a remedial agent in syphilis, scrofula, and in various cutaneous and other diseases, and it is said to be very highly esteemed by them in such cases. Up to the present time, its employment has been almost entirely confined to the Eclectics, or, at least, we have no authentic information of its having been used by the regular medical practitioners, either in North America or elsewhere. Its supposed active resinoid principle, termed *corydalin*, having been recently introduced to the notice of the medical practitioners of this country, a short notice of the plant from which it is obtained, together with the general and chemical characteristics and reputed medicinal properties of its root or tuber, is desirable in our Journal.

Synonyms.—This plant is the *Corydalis formosa*, Pursh, Fl. ii. p. 462, and Neck.; the *Corydalis biaurita*, Hornm. and Vahl?; the *Diclytra formosa*, DC. Syst. ii. p. 109 (in part), and Prodr. i. p. 125; the *Dielytra formosa* of Torr. and Gray, vol. i. p. 67; the *Dicentra formosa*, Borkh. and Gray's Gen. vol. i. p. 120; the *Fumaria formosa*, Andr. Bot. Rep. t. 393, and Sim's Bot. Mag. t. 1155; the *Fumaria eximia*, Ker. Bot. Reg. t. 50; the *Dicentra eximia*, DC. l.c., and the *Eucapnos formosus*, Bernh. The name by which it is known to the Eclectics, and by which it has been introduced to the medical profession in America and in this country, is *Corydalis formosa*. The generic name *Corydalis* is however not in accordance with the present views of botanists, as that genus is more especially characterised by its flowers having only one of the exterior petals saccate or spurred at the base; while the genus *Dicentra*, *Diclytra*, or *Dielytra*, as it is variously termed by different botanists, has flowers with two of the exterior petals saccate or spurred at the base. This latter character is found in the present plant, and hence the generic name *Dicentra*, originally given to it by Borkhausen, and adopted by Gray,* has been used by us in this place in common with that of *Corydalis*. We use the latter term as well, to prevent any confusion as to the plant intended. In common language, it is known under the names of Turkey Corn, Turkey Pea, Stagger-weed, Choice Dielytra, etc.

Etymology.—According to Gray,† the generic name *Corydalis* was "an ancient name for the 'crested lark,' and for some plant of the Fumitory family, which probably took the name from the spur of the flower, being somewhat like that of the Larkspur." The generic name *Dicentra* is derived from δὶς *double*, and κέντρον, spur, in allusion to the two-spurred or saccate petals which its flowers present, as already noticed. The specific name *formosa*, signifying

* Gray's 'Genera of the Plants of the United States,' vol. i. p. 119.

† Gray's 'Genera,' as above, vol. i. p. 124.

beautiful, was given to it from the beauty of the plant. The common names by which it is distinguished, have been derived from the supposed resemblance of its tuber to other well-known substances, or from its reputed properties, or from the pretty appearance of the plant.

Botany.—*Dicentra formosa* has been placed in the Natural Order *Fumariaceæ* by De Candolle, Meisner, Lindley, and most other botanists of eminence. Some botanists of reputation, as Jussieu, have however merged the Order *Fumariaceæ* in the *Papaveraceæ*; and in Endlicher's Genera, and in Linnæa, by Bernhardi, the Fumariaceæ are also placed as a Suborder of the Papaveraceæ. As the order Fumariaceæ is now characterized, we regard the *Dicentra formosa* as belonging to it.

Generic Character.—*Calyx* of 2 very small sepals. *Corolla* of 4 petals, 2 exterior, equally saccate or spurred at the base. *Flowers* racemose. *Fruit* capsular, pod-shaped. *Seeds* numerous, crested.*

Specific Character.—Perennial herb, acaulescent. *Tuber* rhizomatous, scaly. *Leaves* three or more, springing from the tuber, with slender channelled petioles, ternately compound, and with pinnately multifid segments, very glaucous beneath. *Scape* 6–12 inches high, bearing cymose clusters of flowers, and crowded purplish bracts. *Flowers* nodding, reddish-purple. *Sepals* 2, deciduous. *Spurs* of the two exterior petals short, somewhat incurved, obtuse; the inner petals with wings projecting upwards. *Stamens* 6, with the filaments distinct below, but united above; *anthers* with longitudinal dehiscence. *Ovary* 1-celled, with 2 parietal placentas; *stigma* 2-horned at the apex.†

Habitat.—It grows in the clefts of rocks, on the hills and mountains of Virginia and North Carolina, *Pursh*, *Nuttall*, *Le Conte*.‡ According to De Candolle,§ it is also found in Canada. It is said to delight in rich soils and decaying vegetation in the above situations. It is a beautiful plant, and flowers from about May to September. On account of its beauty, and from the long period in which it remains in flower, it is a favourite plant for cultivation in gardens, etc.

Collection, etc.—The only part of the plant which is employed in medicine is the tuber. This should be collected late in the autumn after the leaves have died down, or in the spring before active vegetation has commenced.

General Characteristics.—The tuber, or root, as it is improperly called, when in a fresh state, is almost globular; but when dried, as in commercial specimens, it has commonly an irregular rounded appearance, and is more or less flattened at its two extremities, although more so at one end than the other, so that the whole assumes a somewhat placentiform shape. Occasionally it becomes pear-shaped; and it is usually more or less angular. The number of angles is ordinarily three, the edges being rounded, so that the general outline would then be described as trigonal; in rare cases, the angles are sharp. It varies in size from about a common white mustard-seed, to that of the grains of Indian corn or maize; the average size being about that of a common pea. The external surface, except at the upper and lower extremities, is nearly smooth, as it presents only a few slight wrinkles and depressions, and occasionally an angular projection, which extends from the upper to the lower surfaces. At the depressed extremities, the surface is much more irregular, particularly on one of them; this is caused by a portion of the leaves, roots, and subterranean branches, which have arisen from these points, remaining

* Torrey and Gray's 'Flora of North America,' vol. i. p. 66; and Gray's 'Genera of the Plants of the United States,' vol. i. p. 119.

† See Torrey and Gray, as above, p. 67, and Gray's 'Genera,' pp. 119 and 120.

‡ Torrey and Gray, as above.

§ 'Prodromus,' vol. i. p. 125.

attached to the dried tubers, and thus giving to such parts a more or less scaly and fibrous appearance. In colour, externally, the tubers vary from a yellowish-grey or yellowish-brown, to a dark brown or blackish. Internally, they present various shades of yellow, and have a glistening appearance at certain points of their surface; and are starchy, or sometimes somewhat horny, in texture. These varying appearances internally, are evidently due to the age of the tubers when gathered, the mode in which they have been dried, or the length of time they have been kept. The powder is of a yellowish-brown colour, and when rubbed between the finger and thumb it is somewhat harsh to the touch. When fresh, the tubers have a faint peculiar odour, which is, however, almost imperceptible in a dried state when they have been long kept, except when they are moistened with warm water, and even then it is by no means very marked. When chewed, they have a slightly bitter and by no means disagreeable taste at first; this is followed ultimately by a feeble tingling and sensation of warmth in the mouth and throat, and a slight increase in the flow of saliva.

Composition and Chemical Characteristics.—The tubers were examined chemically in the year 1855, by Mr. W. T. Wenzell, who made them the subject of an inaugural essay, which he presented to the Philadelphia College of Pharmacy.* According to his experiments, they contain the alkaloid *corydalia* or *corydalina*, *fumaric acid*, *yellow bitter extractive*, *acrid oleo-resin*, *tasteless resin*, *brown colouring matter*, *starch*, *albumen*, *arabin*, *bassorin*, *cellulose*, *salts of potassa*, *lime* and *magnesia*, *alumina*, *sesquioxide of iron*, and some other unimportant inorganic matters. Their active properties are said to be taken up by water and alcohol.

Corydalina was obtained by Mr. Wenzell by making at first a hydro-alcoholic tincture, then draining off the alcohol, filtering, precipitating with ammonia in slight excess, washing the precipitate, treating it with boiling alcohol, evaporating the solution thus obtained to dryness, treating the residue with dilute hydrochloric acid, precipitating with ammonia, dissolving the precipitate in boiling alcohol, concentrating the tincture, and allowing it to stand, when, in a few hours, a crystalline compound was deposited. The alkaloid thus obtained, when afterwards purified by repeated solution in alcohol and subsequent crystallization, was in transparent, minute, colourless, four-sided prisms.

These crystals are unalterable in the air, tasteless, inodorous, very soluble in alcohol, ether, and chloroform, but insoluble in water. They form salts with acids which are very soluble in water, and have a bitter taste. Nitric acid, even when much diluted, colours corydalina red or blood-red.†

From his experiments Wenzell concluded that the alkaloid obtained by him as above was identical with that previously discovered by Wackenroder in the European species, *Corydalis foliacea* and *C. bulbosa*,‡ and which he had termed corydalia, and which was afterwards more particularly examined by Winckler and Dobereiner.§ Parrish says|| that *corydalia*, or *corydalina*, as it is termed by him, is similar to the alkaloid *fumarina*, which is obtained from a nearly-allied plant, the *Fumaria officinalis*, except that the latter is soluble in water and insoluble in ether; the reverse being the case with the former.

This alkaloid *corydalina* must not be confounded with the Eclectic remedy,

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* Amer. Journ. Pharm. vol. xxvii. p. 205.

† Amer. Journ. Pharm. vol. xxvii. p. 207; Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1402; and Parrish's 'Practical Pharmacy,' 2nd edit. p. 399.

‡ Phil. Mag. Ann. vol. iv. p. 153, and Brande's 'Chemistry,' vol. ii. p. 1461.

§ Liebig's 'Organic Chemistry,' vol. ii., Paris; and Brande's 'Chemistry,' 1848, vol. ii. p. 1462.

|| 'Practical Pharmacy,' p. 399.

corydalin. This is a kind of resinoid extract of Corydalis, and appears essentially to be a mixture of *corydalina, resin, bitter extractive*, and *colouring matter*. Corydalin may be prepared by making a concentrated tincture of the tubers, as in the case of the other resinoid extracts, and proceeding afterwards in the manner previously described in speaking of them.* This resinoid is regarded by the Eclectics as possessing in itself the entire therapeutic virtues of the plant.†

An infusion of the bruised tubers, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for about twenty-four hours; had a very pale, somewhat yellow colour, a faint peculiar odour slightly resembling the wort obtained in the preparation of beer, and a very slight bitter taste. It exhibited the following reactions:—*Blue litmus paper* was slightly reddened; *tincture of iodine* produced a deep violet-black coloration; the *solutions of perchloride* and *persulphate of iron* caused but a very slight greenish-brown coloration, even after forty-eight hours' maceration; *solution of sulphate of copper* had no very evident effect at first, but ultimately it caused a dirty white, powdery precipitate; the *solutions of the acetate* and *basic acetate of lead* produced abundant precipitates; *solution of oxalate of ammonia* rendered the infusion somewhat opaque, and at length caused a slight whitish floating precipitate. The solutions of *nitrate of baryta, ferrocyanide of potassium, chromate of potash, nitrate of silver, bichloride of platinum, chloride of calcium, sulphate of lime, protochloride of tin*, and *potassio-tartrate of antimony; infusion of galls, nitric, sulphuric*, and *hydrochloric acids*, and *solution of ammonia*, had no very evident effects, when added to the infusion.

From these reactions it is very evident that boiling water does not by any means extract the active properties of the tubers, as it is reputed to do, as previously noticed. From our experiments we find proof spirit to be the best solvent, and hence we should regard the tincture as one of the best forms for administering the corydalis as a remedial agent.

When *nitric acid* was applied to a transverse section of the tuber, it caused a reddish tint over the whole surface. No perceptible effect was produced upon a section, either by *sulphuric* or *hydrochloric* acids.

Medicinal Properties and Uses.—The tubers of *Dicentra (Corydalis) formosa* are reputed to possess antisyphilitic, resolvent, tonic, diuretic, alterative, antiscorbutic, and other properties. The resinoid extract called *corydalin* is regarded by the Eclectics, as just noticed, as possessing all the active properties of the plant. It is said to be especially valuable in syphilis and scrofula. In the former its effects are described by some writers as almost magical. Dr. Grover Coe‡ says, "perhaps no single remedial agent possesses more positive and energetic antisyphilitic and antiscorbutic properties than corydalin." It is also considered by the Eclectics to be valuable in the treatment of various cutaneous eruptions, in dropsy, general debility, various diseases of the urinary organs, and in several other diseases.§ In syphilitic affections it is frequently combined with podophyllin.

Administration, Doses, and Preparations.—The tubers have been given in powder, and in the form of tincture, decoction, resinoid extract (*corydalin*), etc. The latter is the preparation in common use by the Eclectics, and is prepared, as already described, in the same way as the resinoid extracts of sanguinaria (*sanguinarin*),‖ podophyllum, actæa, etc.

There are no recognised formulas for the tincture or decoction, but as it is

* See the papers by the author, on *Actæa racemosa*, Pharm. Journ. vol. ii. 2nd ser. p. 462; on *Podophyllum peltatum*, vol. iii. p. 461; and on *Sanguinaria canadensis*, vol. iv. p. 267.

† Dr. Grover Coe's 'Concentrated Organic Medicines,' p. 334.

‡ 'Concentrated Organic Medicines,' p. 335.

§ See Coe's 'Concentrated Medicines,' pp. 334-336.

‖ Pharm. Journ. vol. iv. 2nd ser. p. 267, and vol. iii. p. 461.

important that some definite preparations should be employed in this country to avoid mistakes, we subjoin forms for them.

Tincture of Corydalis.—Take of Corydalis tubers, bruised, *four ounces*, proof spirit *two pints;* digest for fourteen days, express, and filter. Or the tincture may be made in the ordinary way by percolation.

Decoction of Corydalis.—Take of Corydalis tubers, bruised, *half an ounce*, distilled water *one pint;* boil down to sixteen fluid ounces, and strain.

The dose of the powder is from *ten* to *thirty grains;* that of the decoction, from *one* to *two fluid ounces;* and that of the tincture, from *twenty* to *sixty minims*. The dose of corydalin varies from *half a grain* to *three grains*, or sometimes even larger doses have been given. The average dose may be taken as *two* grains.

CINCHONINE.

$C_{20}\ H_{12}\ NO.$

BY MR. JOSEPH INCE.

Scarcely is there anything more perplexing than to consult a variety of authors on the subject of Cinchona and its preparations, with a view to arriving at any definite conclusion; every man appears not only to entertain a special theory of his own, but to think lightly of the speculations of contemporary or preceding writers, from Guy Patin, who in 1662 decided:—

"Le Quinquina ne guérit pas la fièvre intermittente, et nous l'avons abandonné. Jacet ignotus sine nomine pulvis."

Cinchona bark does not cure intermittent fever, and we have abandoned it.

to Briquet (1853) who, in his elaborate treatise, 'Traité Thérapeutique du Quinquina et de ses Préparations,' thus introduces his observations:—

"Il existe déjà quelques travaux sur cette matière; mais comme ils ont tous été entrepris dans des vues particulières, et plutôt dans l'intention de soutenir tel ou tel point de doctrine, que dans le but d'obtenir des notions générales et d'arriver à connaître le *modus agendi* de la médication par le Quinquina à haute dose, ils manquent, ainsi qu'on va le voir, de ce caractère de généralité qui est indispensable même pour l'étude d'un simple médicament.

"Ainsi M. Magendie, voulant lors de la découverte de la quinine, ajouter les résultats de l'experimentation sur les animaux à ceux de l'observation sur les maladies, injecta du sulfate de quinine à des doses assez fortes, mais qu'il n'a pas indiquées, dans la veine jugulaire de plusieurs chiens, et n'ayant rien observé de particulier, il en conclut que cette substance était douée d'une innocuité complète et qu'on pouvait l'administrer sans inconvénient à des doses fort élevées."

Various researches on this substance have been made already, but as they were all undertaken to confirm particular views, and rather with the intention of supporting such and such a theory, than to arrive at general conclusions, and to gain a knowledge of the *modus agendi* of the medical action of Cinchona in large doses, they are deficient, as will be seen in the sequel, in that character for impartiality which is indispensable even in the study of a simple remedy.

Thus M. Magendie, wishing, after the discovery of quinine, to add the results of experiment on animals to those derived from the observation of disease, injected sulphate of quinine in tolerably strong doses (which he has not indicated) into the jugular vein of many dogs, and not having observed anything remarkable, he concludes therefrom that this substance is completely innocuous, and that it may be administered without inconvenience in very large doses.

The truth is, no one seems able to approach the question without a theory; and yet out of the mass of conflicting evidence one fact stands out in bold relief, namely that from Cinchona bark two active principles are obtained, Quinine and Cinchonine; while at the same time it is matter of daily experience that the one alkaloid has almost superseded the other, Quinine enjoying universal reputation, and Cinchonine comparative neglect.

I am desirous of bringing forward some considerable amount of evidence to show that there is no just reason for this exclusive choice, and I think I shall at least be able to demonstrate that the salts of Cinchonine are entitled to more consideration than they receive at present.

Let us turn for a moment to the account given by Briquet of the first introduction of Cinchona bark:—

"D'un côté se trouvaient la plupart des médecins des grands hôpitaux de l'Italie, et les meilleurs praticiens de l'Espagne, lesquels, étonnés de voir cette substance arrêter comme par enchantement les fièvres qu'on ne guérissait point auparavant, ou qu'on ne guérissait, en quelque sorte, que par hasard, ne savaient comment proclamer assez haut des vertus si remarquables, et devenaient nécessairement les partisans du nouveau remède. De l'autre côté se voyaient de nombreux contradicteurs, les uns, protestants enthousiastes (et c'était le plus grand nombre des médecins anglais) ne voulaient pas croire qu'une poudre propagée, disaient-ils, par l'art infernal des Jésuites, fut autre chose qu'une preparation diabolique destinée à faire périr les gens du peuple, sous prétexte de les guérir. Il est vrai que Morton prétend tenir de bonne source qu'il entrait un peu d'intérêt dans ce beau zèle contre la poudre des révérends pères: ces messieurs d'Angleterre trouvaient que les malades guérissaient trop vite."

On the one hand were the majority of medical men attached to the chief hospitals of Italy, and the best practitioners of Spain, who in their astonishment at seeing this remedy arrest, as by enchantment, fevers which beforehand they were unable to cure, or cured only by accident, were unable to extol too highly such remarkable virtues, and necessarily became the partisans of the new remedy. On the other hand were numerous opponents. Some of them, being Protestant enthusiasts (for the most part English physicians), were unwilling to believe that a powder (as they said) introduced by the infernal art of the Jesuits, could be any other than a preparation of Satan, destined to destroy humanity under the pretext of effecting their cure. Morton, it is true, pretends to have good authority for stating that this fine display of zeal against the powder of the reverend fathers contained a sprinkling of self-interest. These English worthies discovered that their patients were too quickly cured.

When this prejudice had been happily surmounted, and the devil was allowed no more than his share in the transaction, another prejudice had its origin in the time of Pelletier (1820) the effect of which has remained to the present day, to the effect that Cinchonine was at best a possible substitute for Quinine.

Chomel, who was commissioned to report on the two Sulphates of Quinine and Cinchonine, with regard to their therapeutic agency, gives but one (published) trial to the latter; Magendie's note is open to the same objection; whilst by universal consent, Quinine is all-paramount as a remedy both here and on the Continent. Yet if we seek for evidence to prove that there is no sound chemical or therapeutical reason for this singular transmitted preference, the difficulty will consist in the selection of authorities; let us begin by consulting the exhaustive pages of Mérat and De Lens, and read the following extracts ('Dictionnaire de Matière Médicale,' vol. ii. p. 288):—

"Le sulfate de cinchonine, qui est très-soluble dans l'eau et dans l'alcool, et l'acétate, qui ne l'est bien que dans un excès d'acide, ont seuls été expérimentés en médecine. D'après les essais de M. Magendie, ces sels, ainsi que la cinchonine elle-même, n'exercent aucune action sur les chiens, auxquels on les donne, ou dans les veines desquels on les injecte. Quant à leur action médicinale, elle se confond tellement avec celle de la quinine et de ses sels, qu'il nous serait difficile, sous ce rapport, d'en isoler l'histoire.

"On avait cru d'abord, cependant, d'après une observation de M. Chomel, que la cinchonine était beaucoup moins active que la quinine ; mais les observations de [list omitted] ont prouvé que leurs sulfates peuvent réellement se suppléer l'un l'autre. MM. Nieuwenhuis, Mariani et Bleynie ont en outre constaté, par des faits multipliés, que ces bases, au moins aussi actives que leurs sels, peuvent être substituées avec avantage, soit comme moins altérables et moins faciles à sophistiquer, soit comme plus agréables à prendre, soit enfin comme moins coûteuses."

The sulphate of cinchonine, which is very soluble in water and alcohol, and the acetate, which is only so in an excess of acid, have alone been tried in medicine. According to the experiments of M. Magendie, these salts, as well as cinchonine itself, have no action on dogs, either when administered or when injected into their veins. With regard to their medical action, it is so closely allied to that of quinine and its salts, that it would be difficult for us, on this head, to offer a separate account.

It was first thought however, from an observation of M. Chomel, that cinchonine was much less active than quinine, but the observations of —— have proved that their sulphates may be mutually interchanged. MM. Nieuwenhuis, Mariani and Bleynie have moreover shown, by multiplied facts, that these bases, at least as active as their salts, could be substituted with advantage, whether as being less changeable and less easy of sophistication, or as being more agreeable to take, or lastly as less expensive.

Again, vol. v. page 596 :—

"Quoi qu'il en soit, ces alcaloïdes et leurs sels offrent, du moins sous le point de vue thérapeutique, tant d'analogie que nous n'avons pas dû en isoler l'histoire."

Be that as it may, these alkaloids and their salts offer, at least in a therapeutical point of view, so much analogy that we have not thought fit to furnish a separate account.

Finding then the impossibility of isolating the effects of Quinine and Cinchonine, these painstaking authors treat of them under one head,—in itself one of the strongest arguments in favour of Cinchonine. When Dr. Barrow was once preaching before Charles II., the monarch remarked at the conclusion of the discourse that the doctor was the most unfair divine he knew, for he so thoroughly exhausted his theme that he left nothing for any one else to say. The royal compliment may be extended to Mérat and De Lens. Should we however be more influenced by an English authority, the short statement of Dr. Royle may be adduced ('Materia Medica,' p. 515) :—

Cinchoniæ Disulphas.—The salt of cinchonia is much more soluble than that of quina, being dissolved by fifty-four parts of cold water, and six of alcohol. It crystallizes in short, oblique prisms. It is considered by Pereira and others to be equal in medicinal activity to the disulphate of quina.

"It may be given in the same doses to produce the same effects, and will form a valuable substitute in the case of a failure of yellow bark. There is, however, a strong prejudice among medical men in favour of the quina salts."

Still more decisive is the opinion of Dr. Christison :—"Prejudice, together

with the unquestionable energy of quina as a remedy, has led to the other alkaloid, einchonia, being overlooked in praetice. The equally strong prepossessions, however, which were long entertained in favour of erown-bark as a febrifuge and stomachic, though it contains little quina, or perhaps none at all, and the proofs which have been given of the great efficacy of grey or Huanueo bark, would justify the inferenee that einehonia too is eminently aetive. Aecordingly trials made with it by Dr. Bardsley in England, as well as by various practitioners of eredit in France, Germany, and Italy, seem to leave little doubt that it is scarcely inferior to quina in the treatment of intermittent fever, and some Continentalists maintain, that while equally energetie, it is likewise less apt to disorder the stomaeh in large doses."

Last, eertainly not least, eomes the masterly summary by Pereira (vol. ii. p. 1407) :—

"*Difference in the Operation of Quina and Cinchonia.*—When we take into consideration the analogy of eomposition and of chemical properties of these two alkaloids, we are led to suspect analogy of physiologieal effects. When they were in the first instance submitted to examination, cinehonia and its salts were thought, principally on the evidenee of Chomel, to be much inferior in aetivity to quina and its salts. But the subsequent observations of Dufour, Petroz, Potier, Bally, Nieuwenhuis, Mariani, Bleynie, and others, have proved that the disulphates of these alkalis may be substituted for each other. Nay, Bally gives the preference to the disulphate of cinchonia, on the ground that it is less irritating than the disulphate of quina."

In presenee of sueh statements, we are I think justified in taking the subject of Cinchonine and its salts under our serious eonsideration as pharmaceutists. An admirable description of this alkaloid is given by Pelletier and Caventou in their original memoir :—

"La einehonine a encore une saveur amère particulière ; mais cette saveur est longue à se développer, et a peu d'intensité, en raison de l'insolubilité de eette substanee. Elle se développe dans la cinchonine rendue soluble par son union avec les acides ; elle est alors très-amère, styptique et persistante, en tout semblable à celle d'une forte décoetion de quinquina, à cela près qu'elle est moins astringente ; l'astringenee de quinquina étant partieulièrement due à un autre principe."

Cinchonine has moreover a peculiar bitter taste ; but this taste is slowly developed, nor is it remarkably strong, on aeeount of the insolubility of the substance. The bitterness is developed in einchonine when rendered soluble by its union with an acid. It is then very bitter, styptie, and permanent, exactly resembling the taste of strong decoction of bark, only less astringent ; the astringency of bark being specially due to another prineiple.

Full details of the preparation of its salts may be found in the memoir by Pelletier and Caventou, in the dictionary of Mérat and De Lens, in the last edition of Brande's Chemistry, and elsewhere. I believe it would be undesirable to quote these processes at length, firstly beeause those interested in the manufaeture of the Cinchona alkaloids are perfeetly well acquainted with all the available sources of information, especially those of an original character ; and secondly those who should be tempted to undertake their preparation without long experience, adequate resourees, and something beyond the teaching of a printed formula, might possibly be disappointed in the results obtained. Nor can I for one moment endorse this declaration :—

"La préparation des sels cinchoniques est très-facile, puisqu'elle consiste dans l'union direete des acides avec la einchonine ou la quinine." (Pelletier.)

The preparation of the salts of Cinchona is very easy, because it eonsists in the direct union of acids with einchonine or quinine.

Though the concluding sentence may be most honourably meant:—

"Quant à l'extraction de ces deux bases, fidèle à notre système de n'avoir aucun médicament secret, et de faire toujours part à nos confrères des résultats de nos recherches, nous en avons donné le procédé dans notre mémoire lu à l'Académie des Sciences; on peut y avoir recours."

With regard to the extraction of these two bases, faithful to our plan of having no secret remedy, and of always communicating the result of our researches to our brethren, we have given the process in our memoir read before the Académie des Sciences, which may be consulted.

I make these remarks the more willingly at the present time, as a most elegant and inexpensive salt of Cinchonine is before the public,—the Muriate of Cinchonine,—which may be obtained through the usual commercial channels; it has the decided advantage of being very soluble in water, as well as being attractive in appearance. I see no reason, though laboratory difficulties seem to oppose, why an equally soluble Sulphate of Cinchonine should not follow in its wake. The best authority (Pelletier) declares, "L'acide sulfurique s'unit à la cinchonine, et forme avec cette base un sel neutre très-soluble: ce sel peut s'obtenir facilement cristallisé." Again, Mérat calls it "le sulfate de cinchonine, qui est très-soluble dans l'eau."

Meanwhile we must rest satisfied with the Muriate, and the following preparations naturally suggest themselves to the pharmaceutist:—

Tinctura Cinchoniæ Comp.
R. Cinchoniæ Muriat. ʒv ℈j;
Tinct. Aurant. 2 pints.
M.

None would probably be sorry to see the Tinct. Quinæ Comp. of the present Pharmacopœia omitted on account of the great difficulty of effecting the solution of the Quinine. Mr. Squire says, "I find by experiment, that in seven days, 39-40ths were dissolved," but the weather, or rather the temperature, has an unfortunate influence in modifying this result; by substituting the Cinchonia salt, the embarrassment disappears.

Solution of Cinchonine.
R. Cinchoniæ Muriat. ℥j;
Aquæ destillat. ℥j;
Tr. Aurant. *ad* ℥xx.
Ol. Cinnam. ℈j;
Sp. rectif. ℥ss.

Dissolve the Muriate of Cinchonine in the water, add the solution to the tincture, to which add the Oil of Cinnamon previously dissolved in the spirit, filter. A strong solution of cinchonine (three grains to a drachm) is thus effected, the oil of cinnamon effectually masking the bitterness of the preparation. It is right to state that Briquet estimates the strength of Cinchonia at one-third less than that of Quina; and Howard estimates the strength of the Muriate of Cinchonine at one-fifth less than that of the Disulphate of Quina. Both statements are open to a doubt.

Syrup of Cinchonine.
R. Cinchoniæ Muriat. gr. xxiv;
Aq. destillat. ʒj;
Syrup. Simpl. *ad* ℥j.
M.

This syrup contains three grains in each drachm. Whilst on this point,

Magendie's syrup may be noticed, although it is rarely used in Continental practice.

Syrup. Cinchoniæ Sulph.
(Magendie.)
R. Cinchoniæ Sulphat. gr. xlviij ;
Syrup. Simpl. 1 lb.

Dissolve the salt in one ounce of water, then reduce the syrup one ounce by boiling, and add the solution.

One last point deserves attention, namely, that there is a degree of irritation connected with the exhibition of Quinine which is much less marked in the use of Cinchonine, and may therefore be fairly brought forward in favour of the latter. Briquet, no mean physiologist, bases his medical treatment on this fact, summing up his remarks as follows :—

(Page 506.) "Les correctifs des sels de quinine se réduisent à peu de chose ; il est aisé de voir qu'avec des notions aussi simples que celles qu'on possède maintenant, on n'a plus guère à prévoir que l'action irritante de la quinine sur les voies gastriques et son influence stimulante sur l'encéphale."

The correctives of the salts of quinine are included in very small compass. It is easy to see that being in possession of our present clear and definite notions, we have only to guard against the irritating action of quinine on the gastric canals, and its stimulating influence on the brain.

I have before mentioned that Dr. Livingstone declared that he had little faith in the disulphate of quinine unless combined with an aperient, and no man can claim to have been more successful in the treatment of febrile diseases than that sensible and intrepid traveller.

Let it not be imagined that in these remarks I wish to throw the shadow of disparagement on an admirable and sterling remedy ; but I am anxious to rescue a kindred alkaloid from unmerited neglect : and I do so on this ground, that some of the first writers and practical physiologists (both here and on the Continent) have pronounced the salts of Cinchonine to be cheap, soluble, and good.

26, *St. George's Place, Hyde Park Corner.*

Note.—Two muriates are mentioned by Pelletier and Caventou.

Dimuriate of Cinchonia.

Cinchonia	89·5
Acid. Muriat.	10·4
	100·0

Muriate of Cinchonia.

Cinchonia	81
Acid. Muriat.	19
	100

ON COMMERCIAL TINCTURE OF SESQUICHLORIDE OF IRON.

BY MR. J. M. DAVENPORT,
Student in the Laboratory of the Pharmaceutical Society.

I have examined several specimens of this tincture for the purpose of showing what difference does and must always exist so long as an indefinite oxide be used in its preparation.

The figures in the right-hand column of the following table represent the amount of sesquioxide of iron precipitated from one ounce of the tinctures :—

Tincture.	Grains per ounce of Fe_2O_3 precipitated.
1	22·21
2	28·22
3	34·57
4	28·22
5	25·48
6	31·10
7	26·80
8	29·63
9	23·14
10	35·05
11	29·87
12	27·86

It will be seen that one-half of these tinctures are of correct strength, for the Pharmacopœia orders that "a fluid ounce should yield a precipitate of sesquioxide of iron weighing *about* thirty grains." But the difference in the other half is considerable. With regard to Nos. 1 and 9, anhydrous oxide has probably been used in their preparation. This oxide is generally prepared by igniting the sulphate, and it is according to the amount of heat employed in its preparation that its solubility depends. It is always difficult to dissolve, and there certainly exists the temptation, to persons making the tincture from this oxide, to leave that which is difficultly soluble undissolved. The difference in strength of the remaining specimens is probably due to variation in the composition of the oxide used. The oxide of iron of the Pharmacopœia is itself somewhat indefinite, containing variable proportions of water and carbonic acid.

In conclusion, I may perhaps suggest a way of rectifying the uncertainty that now exists in the preparation of this tincture. Firstly,—That chemists should estimate the value of their oxide before using it. This can be done roughly by finding the loss by weight upon ignition, or more accurately by dissolving a given quantity of the oxide in acid, precipitating by ammonia (not potash), washing, drying, igniting, and weighing. The amount of iron contained in the oxide can be then easily calculated. Secondly,—That so much of this oxide of iron be used as shall be equal to thirty grains per ounce of anhydrous oxide (that being the quantity ordered in the Pharmacopœia to be precipitated from one ounce of the tincture). A tincture of uniform strength could be thus easily obtained.

ON THE COMPOSITION OF HYDRARGYRUM CUM CRETA.

BY R. HAINES, M.B.

The composition of the Hydrargyrum cum Cretâ was brought under notice by Professor Redwood in the 'Pharmaceutical Journal' for 1860-61, p. 504; and it was then shown that this preparation invariably contained suboxide, and frequently also protoxide of mercury.

A similar course of experiments had made this fact known to me four years previously, and the results were published in the 'Transactions of the Medical and Physical Society of Bombay for 1855-56,' p. 131; but as I have had subsequent opportunities of verifying these observations, and as the publication in question is not very widely circulated, a few further remarks may not be out of place.

Attention was first directed to the subject by the constant occurrence of violent vomiting which followed the exhibition of small doses, of two or three grains only, of Hydrargyrum cum Cretâ, which had been issued from a particular depôt. On the powder being brought for examination, I noticed that it had not the pure gray colour of the officinal drug; the tint decidedly inclined to pink. It was boiled with water, and the solution being filtered and evaporated to dryness, a very distinct orange-brown residue remained, which gave all the reactions of oxide of mercury, showing, not only the presence of uncombined oxide of mercury, but also its decided solubility in a large quantity of water. A weighed portion of the powder was digested in dilute acetic acid as long as anything was dissolved. The filtered solution was treated in the cold with excess of hydrochloric acid, and after twenty-four hours, passed several times through a small tared filter, until the liquid came through clear. The calomel on the filter was washed, dried, and weighed, and calculated as suboxide. The mercury in the filtrate was thrown down by boiling with hydrochloric acid and protochloride of tin, and the metal calculated as protoxide. In this way, the specimen was found to contain 3·90 per cent. of suboxide, and 6·54 per cent. of protoxide of mercury.

Another much older and long-condemned specimen of the same drug was then examined, and its appearance at once showed how greatly it was changed. The colour was hardly gray at all, but a dirty pink or dull salmon colour. Treated in the same way, it yielded 2·19 per cent. of suboxide, and 27·90 per cent. of protoxide. It was observed, that with the exception of a few siliceous particles, the whole was soluble in the dilute acetic acid, so that all the mercury had been converted into oxide. But the figures at once show that there is a considerable deficiency of the mercury itself, which, as the drug was prepared in the Government Medical Stores in Bombay, could hardly have existed at first. The 30·09 of mercurial oxides found, is equivalent to 27·95 of metallic mercury, so that the preparation would have originally contained 27·95 of mercury, to 100—30·09 or 69·91 of chalk. But mercury with chalk is prepared with three parts of mercury to five of chalk, and the 69·91 of chalk should therefore be found united to 41·95 of mercury, which, increased by oxidation in the above proportion of 27·95 to 30·09, would become 45·16. Adding this to 69·91 of chalk, we get 115·07 parts, containing per cent. 60·75 of chalk, and 39·25 of mercurial oxides, of which 36·46 would be mercury. But the specimen contained only 27·95 of mercury, so that the difference, or 8·51, which is equal to 23·34 per cent. of the original quantity of mercury, has disappeared. This sample had been kept for some years in paper.

To the inquiry as to what has become of this mercury, the most obvious answer is, that it has evaporated; and although the volatilization of this metal at ordinary temperatures in our European climate is too minute to be appreciable, this is not the case within the tropics. Faraday has long ago shown, that at temperatures exceeding 60° F., or even 50°, a sensible amount of mercurial vapour is formed; but at the ordinary temperature in Bombay, from 80° to 90°, this volatility is much more decided. A piece of gold superficially whitened with quicksilver, reacquires its yellow colour in a few days; and, what is more to the purpose, I have frequently seen a few grains of fresh grey powder, folded in paper in a thin layer, to have become perfectly white in a week or two from the escape of the whole of the metal. This increased volatility, at once, I think, explains the loss of mercury in the above specimen, and the rapidity and completeness of the oxidation, both effects being further facilitated by the extreme state of division to which the metal is reduced. In the Government Stores, the process of preparing it occupies often as much as six weeks or two months; the trituration, which is effected in large

marble mortars, being carried on for an hour or two a day, as the workmen have leisure from other employments.* I examined some which was still under trituration, having been six weeks in the mortar, and found already ·92 per cent. of suboxide, but no protoxide. A sample from the stock in the stores, kept in glass bottles exposed to daylight, yielded 3·22 per cent. of suboxide, and ·50 per cent. of protoxide. Another sample gave 1·27 per cent. of suboxide, but no protoxide. A sample from a private establishment, six months in Bombay, yielded ·96 per cent. of suboxide; and another from a different establishment, eighteen months in Bombay, 1·52 per cent. of suboxide: but both were free from protoxide.

In the year 1858, I was called on to examine two other samples from the stock of a large public hospital in Bombay. One sample had, in a marked degree, the dirty salmon colour above described. It likewise contained no trace of metallic mercury, but of suboxide 2·16 per cent., and of protoxide 29·48 per cent. By a calculation similar to that above given, the deficiency or loss of mercury is found to be 6·22 in 100 parts, or 18·88 per cent. of the original quantity of mercury. The second sample was but slightly changed in colour; it contained per cent. 3·82 of metallic mercury, 5·80 of suboxide, and 24·98 of protoxide; showing a loss of 4·06 in 100 of mercury, or of 12·48 per cent. of the original quantity of metal. This sample has been since kept in paper, and it has now acquired the marked pink tinge of the fully oxidized preparation. The metal has disappeared.

These analyses, expressed in a tabular form, may be compared with the corresponding table of Professor Redwood.

	Hg	Hg_2O—	HgO—		Hg	Hg_2O—	HgO—
1.	?	3·90	6·54	6.	?	·96	0
2.	O—	2·19	27·90	7.	?	1·52	0
3.	?	·92	0	8.	O	2·16	29·48
4.	?	3·22	·50	9.	3·82	5·80	24·98
5.	?	1·27	0				

The following conclusions given in my original report do not differ greatly from those in Professor Redwood's subsequent paper:—

"1st, that the trituration ought not to be carried beyond the point of ensuring the complete extinction of the mercury, for the long-continued trituration after that point is attained, divides the metal so extremely, as to promote its too rapid conversion into oxide; 2nd, that the preparation should be used in as recent a state as possible; 3rd, that it should be carefully protected from the action of the light; and 4th, that the alteration in colour from ash-grey to pinkish-grey, which is easily observed, affords a strong presumptive evidence of the presence of peroxide of mercury."

If, as has been shown, this preparation occurs so often in an oxidized state as to be an unsafe and untrustworthy medicine in Europe, still more is this the case in a tropical climate, and it might be well if its use, in India at least, were altogether discarded. A mixture of calomel and starch would probably form the best substitute; and if colour were an object, a careful addition of Æthiops mineral or lamp-black would at once impart to the mixture the well-known grey tinge.

Bombay, 11*th November*, 1862.

* The operation is performed only in the rainy season, on account of the ease with which, from the dampness of the chalk, the quicksilver is then killed.

COD-LIVER OIL WITH CITRATE OF IRON.

Having an order recently for cod-liver oil with ammonio-citrate of iron, we tried two or three plans for making it without succeeding in dissolving the citrate, and we therefore ordered the article from a well-known London pharmaceutist. When it came, we found that his success was no greater than our own; and in reply to our communication, he sent us a bottle from another well-known house. This was darker in colour, having apparently been made some time; but finding the indication of iron to be very slight we sent a small sample to a friend of ours, a chemist known in the scientific world, and he assured us, that to estimate the salt of iron at a quarter of a grain in each ounce would be above the mark.

This being the case, I would call attention to the value, or rather want of value, of such a preparation. Certain substances, as quina and iodide of iron, are known to be soluble in cod-liver oil; whilst others of a different character, as the salt in question, are now introduced as available for the purpose; but unless it can be proved that such medicated oils can be prepared of a reasonable strength, they only become a source of annoyance to the chemist, and of deception to the patient.

William Southall, Jun.

Birmingham, 19*th January*, 1863.

NOTES ON THE CHILIAN DRUGS OF THE NOVARA EXPEDITION.

BY PROFESSOR DR. SCHROFF, OF VIENNA.*

During the past winter I received two cases of drugs from the Cape of Good Hope and from Chili: shortly previous to this Dr. Schwarz presented me with a collection of Chilian drugs, which though poor as to the size of the specimens was rich in number, containing most of those comprised in the first-named collection, together with several others. This collection Messrs. Jelinek and Schwarz obtained from Mr. Friedrich Leybold of Santiago, to whom our Society and the pharmacological collections of the University are therefore much indebted, and to whom I now return our sincere acknowledgments. Mr. Leybold likewise furnished a catalogue of the collection, which besides the popular names of the drugs contained some brief observations on their action and mode of administration, but no information as to botanical origin. In determining the scientific names of the plants which yield these drugs, I have derived especial assistance from M. Gay's *Historia fisica y politica de Chile*, an excellent and classical work of which the botanical part in eight volumes was published between the years 1845 and 1852. The medicinal uses of the remedial plants and their trivial or popular names are frequently given by M. Gay and agree in general with those supplied by Mr. Leybold. The present short sketch of these Chilian drugs is preliminary to a more detailed account which I hope to give on some future occasion.

In looking over the fifty-four vegetable medicinal substances from Chili which constitute the collection, and but few of which are not determinable, it is remarkable to find many that are well-known natives of Europe; this is explained by the fact that the medicinal plants of Europe were among the benefits of civilization which the missionaries introduced into Chili soon after its discovery. They are interesting in so far as they indicate what variations may be brought about by different conditions of climate. It is interesting too to observe how they are employed in Chili, as some insight is thereby obtained into the condition of popular medicine in that country and the view which practitioners there take of medicines and their action. The remaining drugs are for the most part peculiar to Chili, or have been introduced from neighbouring coun-

* Translated with some abridgment from the *Wochenblatt der Zeitschrift der K. K. Gesellschaft d. Aerzte zu Wien*, No. 26-27, 1862, by Daniel Hanbury.

tries; a small group consists of substances used for food or enjoyment, others are medicinal and a few are applied to technical purposes. In the following list, I have given first the popular Chilian designation of each drug, then the scientific name of the plant affording it with occasionally some brief observations.

To the first group belong the following eleven:

1. *Escorzonera-thee.*—According to Gay this consists of the root of *Scorzonera hispanica* and of some species of *Achyrophorus*, as *A. Scorzonera*, *A. apargioides* and *A. spathulatus;* it is used in Chili in syphilis and as a refrigerant in fevers.

2. *Chinas*, or *China*, is the flowering plant of *Calendula officinalis*. An infusion is reputed to cool the blood and is also used as a healing wash for wounds.

3. *Artemisia*, is the flowering plant of our *Pyrethrum Parthenium;* its infusion is used in flatulence and also for a footbath. According to Gay it is also prescribed in hysteria and spasms.

4. *Clonqui*,—the entire plant of *Xanthium spinosum*, used in gonorrhœa.

5. *Romero de Castilia.*—Gay refers *Romero*, *Romerillo* or *Romero de la tierra* to *Baccharis rosmarinifolia* Hook.; but the plant which we have received is a labiate, none other in fact than *Rosmarinus officinalis*, of which it is the small-leaved form. It would seem therefore that *Romero de Castilia* and *Romero de la tierra* are two distinct plants: the former is used in Chili in ointments and for fumigation.

6. *Poleo* is *Mentha Pulegium*, used in footbaths in colds, also for inhalation in headache, and, according to Gay, also employed as a poultice for wounds.

7. *Borraja* is our *Borago officinalis;*—employed in the form of enema in obstructions, also in infusion as cooling and diuretic.

8. *Yerba mora; Witheringia rubra* and *Solanum nigrum*, used to heal wounds and to make a gargle in angina.

9. *Malva del pais; Malva nicæensis* All. and *M. rotundifolia* L.

10. *Ruda*, the entire plant of *Ruta bracteosa*, used in infusion in pains in the stomach. Gay admits this drug to possess strongly stimulating properties and states that it occasions great excitement, fever and, if taken in large quantity, even death. It is given as a carminative and antispasmodic in hysteria, epilepsy and convulsions, and is also used as an emmenagogue. Applied to the stomach as a cataplasm it raises blisters.

11. *Verdolaga; Portulaca oleracea.* Used as a clyster in dysentery, and according to Gay reputed to be cooling, vermifuge, etc.

Among substances used as aliments or delicacies, we must reckon the following:

1. *Luche*, or *Luchi* is that almost ubiquitous seaweed *Ulva latissima* L.; it is found in commerce either in the form of thickish cakes which are of a greyish colour externally from adherent fine sand, or else isolated, somewhat cleaner, and of a very dark green colour. It is an esteemed dish when boiled in water or fried in fat.

2. *Cochaynyo* or perhaps more correctly *Cachaguyo* is *Durvillæa utilis* Bor., a seaweed often thirty feet long, very common from the Malvines to the coast of Valparaiso and round Cape Horn. In Chili it is frequently sold as an edible vegetable. In the dry state as it occurs in trade, it is seen in bundles, consisting of pieces of the seaweed about three feet long, two inches broad and two to three lines thick, of a cartilaginous or horny hardness, very light, of a bright yellowish-brown colour and internally formed of honeycomb-cells. In water it softens, but does not break down into mucilage even by long boiling.

3. *Aji*,—the fruits of *Capsicum annuum*, reduced to coarse powder, and packed in little gourds which much resemble earthen vessels. Found in almost every household, being an ingredient in most Chilian dishes.

4. *Maté*, generally called simply *Yerba*, is the half-pulverized leaves and stems of *Ilex paraguayensis*, the infusion of which constitutes the well-known favourite beverage of the Chilians.

5. *Vinagrilla.*—This is the name used in Chili to designate certain small thin, greyish cakes of about three inches diameter, formed by pounding the fresh herb of *Oxalis rosea* and *O. Dumetorum*, kneading it into cakes and drying it. These cakes when macerated in water afford a refreshing drink which is used in Chili in the same way as an infusion of tamarinds in other tropical countries, and as lemonade with us. Chili is very rich in *Oxalis*, of which it possesses forty-one species.

The third group contains the following medicinal substances peculiar to Chili, the first four being ferns :

1. *Calaguala* or *Calahuala*, which is the subterraneous stem of *Polystichum coriaceum* and *Goniophlebium translucens*, has the greatest resemblance to the rhizome of our own *Polypodium vulgare*. It is commonly used in Chili as an aperient, sudorific and resolvent.

2. *Yerba de la Garto, Yerba de Lagorto* of Gay ;—the fronds of the last named ferns.

3. *Doradilla*, the fronds of an undetermined species of *Polypodium :* an infusion made from them is used as a healing application to wounds.

4. *Palmilla*, fronds of *Blechnum hastatum* and some species of *Polypodium*, used as tea by the women of the Cordilleras and supposed to be strengthening.

5. *Chepica banca*, the rhizome of *Paspalus vaginatus* Sw., common in all Chili, where it supplies the place of our *Radix graminis ;* its decoction is used as a purifier of the blood, and the infusion is administered in disorders of the urinary passages and as a cooling medicine.

6. *Matico* or *Matica*,—leaves of *Piper asperifolium*, a native of Peru, cultivated in Chili, and long known in Europe ; the powder of the plant and decoction are frequently used to promote the healing of old ulcers.

7. *Paico, Chenopodium ambrosioides* L., common in Chili in fields and gardens. Herb used for an injection for pain in the stomach ; and the still more powerful root in other stomach complaints, including indigestion ; essential oil, vermifuge.

8. *Sanguinaria de la Cordillera* is derived according to Gay from *Polygonum Sanguinaria*, a plant which, with *P. maritimum*, grows on the sandy sea-shore at Coquimbo and Valparaiso, and not in the Cordillera as the name implies. Leybold observes that the *Sanguinaria* is used as an emmenagogue and Gay, that it is frequently applied in female complaints. An accurate examination of this root promises some interesting results.

9. *Sanguinaria fina*, the species which especially grows on the plain : it is scarcely to be doubted that this drug, which is different from No. 8, is the root of *Polygonum aviculare* L. and *P. maritimum* L., both of which are common in Chili. The leaves of the first-named were formerly used in Europe in diarrhœa and hæmorrhage, and also for the healing of wounds and ulcers.

10. *Vira*, generally called *Vira-vira*, is *Gnaphalium Vira-vira*, a plant common at Coquimbo. Gay says of it "planta vulneraria y febrifuga," and Leybold names it as a cooling remedy in paroxysms of fever ; the infusion is used in coughs and also as a wash for abscesses.

11. *Cachanlaguan ; Erythræa chilensis* P., very common in Chili, where it is prized as a purifier of the blood and a febrifuge ; sudorific and tonic properties are also ascribed to it. It has been also introduced into Spain.

12. *Cedron-thee*, derived according to Gay from *Lippia lycioides* and *L. citriodora ;* it is taken in infusion in the morning fasting, as a remedy in stomach complaints, and is also used in hysterical and nervous affections and hemicrania.

13. *Palqui* or *Parqui ;* long shavings of the wood of *Cestrum Parqui* L'Hérit., a small tree common at Valparaiso, Santiago and Concepcion ; it diffuses a sickly odour at night. The shavings of the wood are given in infusion and decoction in malignant fevers and in many other complaints. According to Leybold, *Parqui* in the form of tea proves an excellent sudorific.

14. *Piche* or *Pichi*,—*Fabiana imbricata* R. et P. (*Solanaceæ*) a shrubby plant resembling a tamarisk or perhaps still more savine, growing in fields and on sandy shores in Chili. The woody branches with their leafy twigs are the parts used ; the leaves are very small, scale-like, sessile, ovate, concave, entire, glabrous and imbricated. This bitter, resinous-smelling shrub is famous as an excellent remedy against a certain disease called *pizguin*, to which sheep and goats in Chili are subject. It is also administered to the human subject in infusion, and as an addition to baths.

15. *Natri.* The stems of this plant, which is the *Solanum crispum* of Ruiz and Pavon, are used as a stomachic, also according to Gay in inflammatory fevers.

16. *Yerba mora ; Witheringia rubra*, has been already mentioned, but is named again because it belongs peculiarly to Chili.

17. *Panno* or *Panil*, the leaves of *Buddlæa globosa* Lam., are used when crushed fresh to disperse tumours and as an application to wounds, and the powder and decoction in ulcers.

18. *Visnaga; Ammi Visnaga* Lam., expressed juice applied in hæmorrhoids: rays of the umbel used (as in the South of Europe and in the East) for toothpicks.

19. *Panul; Ligusticum Panul*, common in Coquimbo and Santiago. Smelling the root recommended in headache; infusion said to purify the blood.

20. *Quintral de Romero;* Gay applies the name of *Quintral* to the whole genus *Loranthus*, which in Chili embraces eleven species, identifying at the same time *Quintral de quisco* as *L. aphyllus*. Our *Quintral de romero* consists of leaves, which are certainly those of a *Loranthus;* they are used in infusion as a drink and also in baths.

21. *Pila Pila; Malva caroliniana.* Infusion of leaves, much used in fevers and maladies of the throat.

22. *Quelenquelen;* according to Gay, two species of *Polygala* are known in Chili under this name. One of them is *P. gnidioides* Willd., which grows in meadows in the province of Concepcion in Valdivia, has leaves which taste somewhat astringent but scarcely bitter, and is very frequently used as a diuretic by the Indians. The other, *P. thesioides* Willd., occurs in Central Chili; its roots in decoction are employed in various internal disorders, especially for pains in the stomach. It is confounded by the inhabitants with *Monnina linarifolia*, a plant possessing similar properties.

23. *Quajacan, Guayacan* or *Palo santo; Portiera hygrometrica*, R. et P.; shavings of the wood used in syphilis and rheumatic pains.

24. *Retamilla; Linum aquilinum* and *L. ramosissimum.* The entire plant is used in infusion in cramps of the stomach, also in cases of indigestion; it is reckoned to have cooling, febrifuge effects, and as such is employed in many other complaints.

25. *Fumaria; Fumaria media* Lois.,* considered tonic, stomachic and antiscorbutic.

26. *Pangué; Gunnera scabra* R. et P. The stout rhizome, which when cut transversely into flat pieces resembles that of a *Nyphæa*, possesses acidulous, astringent properties, and is used in decoction against diarrhœa, hæmorrhage and stomach disorders.

27. *Quinchamali*, is the herb of *Quinchamalium*, three species of which *Q. majus*, *Q. ericoides* and *Q. gracile* are enumerated by Gay, though probably they are all referrible to the *Q. chilense* of Molinos, with whose description our drug entirely agrees. All three species are frequently applied by the Chilians as healing remedies for wounds, as also for inward complaints, ulcers, extravasated blood, etc. Leybold observes that an infusion of the plant is used as a counterirritant in which character it occasions an eruption on the skin.

28. *Flor de Mosqueta* are the petals of different species of rose of which Gay names eight as occurring in Chili; they are used for purifying the blood.

29. *Pimpinella, Acæna pinnatifida* R. et P. of the order *Rosaceæ* is given by Gay as the plant called *Pimpinela cimarron.* I have received two drugs under the name *Pimpinela*, the one of which agrees with the *Acæna.* They are administered in infusion as emmenagogues.

30. *Algarrobo de Mendoza* are the pods of *Prosopis Siliquastrum* DC., crushed and boiled, they are the basis of a refreshing drink which is reputed to improve and thin the blood. The pods also serve as fodder for cattle.

31. *Culen.* Alburnum of the wood of *Psoralea glandulosa* L., used in decoction in gastric affections, also as a wash for wounds. The flowers and more or less developed pods are sold as *Flores de Culen*,—indeed almost all parts of the plant are used in Chili, the root as an emetic, the leaves as stomachic, anthelmintic and healing, and the ashes as a purgative.

32. *Quilmay.* The root and stem of a perennial plant which Gay states to be *Myriogyne elatinoides* Less.; of its uses I have no information.

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* It is not evident why the author places this plant in the present group; the same remark applies to *Ammi Visnaga, Solanum nigrum* and *Polygonum maritimum*, none of which are plants peculiar to Chili.

The following drugs serve more for use in the arts or as cosmetics, than for medicinal purposes.

33. *Daudal ; Flaveria Contrayerba* Pers. A concentrated decoction of this plant serves as a yellow dye.

34. *Quillay*, the bark of the well-known soap-bark tree *Quillaja Saponaria* Mol. The decoction is used by the women of Chili for washing the hair ; it also serves for the cleaning of cloth and silk-stuffs, taking the place of soap, which it exceeds in cleansing power. It is generally thought that the Chilians and Araucanians are indebted for the beauty of their hair to the cleansing effects produced by the frequent use of this bark.

In addition to the foregoing drugs, I have received some of which I have been unable to determine the origin : they are the following :

1. *Orocoipo de la Costa.* Twigs and stem of a tree or shrub, said to be emmenagogue.

2. *Cardo santo ;* roots and stalks used in infusion as a purgative. Gay applies the name to *Argemone mexicana* and *Cnicus benedictus*, with neither of which plants our drug agrees.

3. *Cepa Caballo*, a root and herb, resembling a *Potentilla*, used in liver complaints.

4. *Don Diego de la Noche*, belongs apparently to *Boraginaceæ.* Used against cancer of the uterus.

5. *Correcol*, antiscorbutic. *Corre Corre*, mentioned by Gay as used in ophthalmia, toothache, etc., is *Geranium rotundifolium.*

6. *Triaca*, the stems of an unknown plant.

7. *Zanten*,—resembles a *Plantago.* I have no information upon its uses.

In order the better to review the drugs just described, I have in the following list arranged them according to the natural families.

Algæ
Cachayugo, *Durvillæa utilis.*
Luchi, *Ulva latissima.*

Filices
Calaguala, Yerba de la Garto, } *Polystichum coriaceum.*
Palmilla, *Blechnum hastatum.*
Doradilla, *Polypodium sp.*

Gramineæ
Chepica, *Paspalus vaginatus.*

Piperaceæ
Matico, *Piper asperifolium.*

Chenopodieæ
Paico, *Chenopodium ambrosioides.*

Polygoneæ
Sanguinaria, *Polygonum Sanguinaria.*
Sanguinaria fina, *P. aviculare.*

Santalaceæ
Quinchamali, *Quinchamalium majus, Q. ericoides.*

Compositæ
Escorzonera, *Scorzonera hispanica.*
„ *Achyrophorus* sp.
China, *Calendula officinalis.*
Vira, *Gnaphalium Vira-vira.*
Artemisia, *Pyrethrum Parthenium.*
Daudal, *Flaveria Contrayerba.*
Clonqui, *Xanthium spinosum.*

Gentianeæ
Cachenlaguen, *Erythræa chilensis.*

Labiatæ
Romero de Castilia, *Rosmarinus officinalis.*
Poleo, *Mentha Pulegium.*

Verbenaceæ
Cedron, *Lippia citriodora, L. lycioides.*

Asperifoliæ
Borraja, *Borago officinalis.*

Solanaceæ
Aji, *Capsicum annuum.*
Parqui, *Cestrum Parqui.*
Piche, *Fabiana imbricata.*
Natri, *Witheringia crispa.*
Yerba mora, *W. rubra.*

Scrophularineæ
Panno, *Buddleia globosa.*

Umbelliferæ
Panul, *Ligusticum Panul.*
Visnaga, *Ammi Visnaga.*

Loranthaceæ
Quintra, *Loranthus sp.*

Papaveraceæ
Fumaria, *Fumaria media.*

Portulacaceæ
Verdolago, *Portulaca oleracea.*

Malvaceæ
Pila Pila, *Malva caroliniana.*
Malva del pais, *M. rotundifolia.*

Polygaleæ
Quelenquelen, *Polygala gnidioides.*

Ilicineæ
Maté, *Ilex paraguayensis.*

Rutaceæ
Ruda, *Ruta bracteosa.*

Zygophylleæ
Quajacan, *Porliera hygrometrica.*

Lineæ
Retamilla, *Linum aquilinum.*

Oxalideæ
Vinagrilla, *Oxalis rosea, O. Dumetorum.*

Halorageæ
Pangue, *Gunnera scabra.*

Rosaceæ
Quillay, *Quillaia Saponaria.*
Pimpinella, *Acæna pinnatifida.*
Flor de mosqueta, *Rosa sp.*

Papilionaceæ
Culen, *Psoralea glandulosa.*
Algarrobo de Mendoza, *Prosopis Siliquastrum.*

THE NEW DEVELOPMENT.

The following letters relate to Mr. Ince's communication on "A New Development." We have also received others, which, being anonymous, are not published.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Mr. Ince has hit the blot in his paper entitled 'A New Development,' though the aptitude of his remedy may be questioned. The objections which apply to the assumption of a trading character by a Society such as ours are too palpable to need illustration; nevertheless, it may be well to turn attention to the circumstances which have induced an acute observer like Mr. Ince to invoke the aid of so manifestly objectionable an alternative.

It must be apparent to all who are acquainted with pharmacy, as it is and as it ought to be, that the trading department (leaving its scientific development for a moment out of the question) is very inefficiently fulfilled. How few of its professors are provided with the means of conducting its most ordinary processes, and how limited, consequently, is the enthusiasm excited in that which should be the most interesting part of our avocations! In this respect pharmacy would seem to have retrograded in the last few years, as compared with an antecedent period, when chemists' shops depended much more upon their own resources. The facility with which most preparations are now obtained from wholesale dealers has caused pharmaceutists to undervalue the importance of a home laboratory, until it has ceased to be a general feature; and those few articles which (like the distilled waters) cannot be conveniently procured from a distance, are substituted by extemporized imitations, while even the old-fashioned and trusty infusions and decoctions are voted too troublesome to be made as required, and must be replaced by essences resembling them in about the same degree as a perfumer's shop resembles a country garden.

Were we more generally accustomed to compound our own preparations, wholesale houses would not be driven to such artifices as the 'development' of a fine yellow colour in the powdered aromatic confection, which assuredly does not belong to it when made in unsophisticated submission to the P. L. directions; but pray who would buy aromatic confection (species) which looked like a pale powder of cardamoms—except indeed those who have been accustomed to make it at home?

The habit of purchasing all our preparations ready-made, reduces us to the rank of mere chapmen in drugs, and by taking from us the laudable emu-

lation which attaches to successful manipulation, is, I believe, one chief cause of a competitive underselling, which has been carried further than is good for ourselves or beneficial to the public. Divorced from our legitimate practice, what other way is left us to achieve pre-eminence than to sell at a cheaper rate, or to offer more diverse attractions in the department playfully designated by Mr. Ince "Inorganic Chemistry"?

That a change may be effected in these particulars is greatly to be desired, and that the Pharmaceutical Society has been, and still is, helping on that change can scarcely be doubted; nor need we be discouraged if the state of transition presents some anomalies calling for rectification. To discover a defect is one step towards its amendment, and it certainly does appear to me that the defect now under notice is of sufficient importance to deserve special consideration, and to call for a special remedy. It has also seemed to me that while the Pharmaceutical Society has unquestionably done much in an indirect manner to improve the trading condition of our business, it might give us some additional direct assistance which would be very welcome; and I feel indebted to Mr. Ince's graphic pen for opening up the subject and attracting an amount of attention to it favourable to the introduction of my more prosaic, but perhaps more practical suggestions.

I would suggest the formation of a museum of pharmaceutical apparatus at the Society's house in Bloomsbury Square, where working models of the various forms of apparatus suitable for the ordinary operations of pharmacy might be seen and tested, and where good practical information might be obtained about them. No one who has had occasion to fit up a laboratory will doubt the convenience of such a museum of reference, where the results of accumulated experience might be gathered together, instead of each person being left to flounder through his own series of failures and misfits. Those of us who have had any experience in this way would no doubt willingly communicate it, so as to make the collection practically useful, and mechanical engineers might be disposed to deposit models gratuitously, with a view to obtaining orders.

Although it is treading upon dangerous ground, yet with the consciousness of meaning no ill, I will venture to allude to a notion, calculated injuriously to influence the character of pharmacy, which seems to need some modification,—I refer to the prevailing idea that pharmacy is a business especially suited for a very small capital. I believe that this opinion has been overstrained, and has called into existence an amount of competition which is by no means advantageous to the small capitalist or to any one else. If the trade of pharmacy is to be carried on in a manner which admits of creditable competition with well-conducted establishments, it is necessary to invest an amount of dead capital bearing a larger proportion to the saleable stock than in almost any other business.

It is not to be supposed that those who have already cast their lot in with us can turn aside to other pursuits; but we may hope, for the credit of future pharmacy, that this consideration will be kept in view by "parents and guardians."

I am, Gentlemen, your obedient servant,

RICHARD W. GILES.

Clifton, January, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I venture to offer a few observations upon the communication favoured by Mr. J. Ince in this month's Journal, the main features of which are,—whether it is not desirable that the Pharmaceutical Society should pre-

pare certain of the Pharmacopœia preparations in its own laboratory, so as to enable those of its members who, having only limited accommodation, and, may be, a small demand for the articles in question, find it both inexpedient and unremunerative to prepare them themselves.

I think, Sir, the question will meet with a favourable reception throughout the country, and that, without wishing to convert the Pharmaceutical laboratory into a large wholesale drug-shop, the manufacture and the vending (to Pharmaceutical chemists only) of a few of the Pharmacopœia preparations which it is impracticable for the retail chemist to prepare on a small scale, would tend to unite and strengthen the existing ties between members and the Society.

The tinctures contained in Mr. Ince's list might, I think, be well omitted, as poor indeed must be the state of that man's pharmacy if he has not his macerating jars or his percolating apparatus, and his boy or apprentice to pound and prepare the ingredients to be exhausted. I would suggest the following list:—Distilled waters, extracts, aromatic spirit of ammonia, and sweet spirit of nitre. The two latter articles being subject to the greatest discrepancies, and never supplied of the same strength and uniformity from two different establishments, are in themselves desiderata to urge the proposed scheme.

As a reader of the 'Pharmaceutical Journal,' I always hail Mr. J. Ince's reappearance in print; but I must ask his permission to state that I consider that part of his last communication alluding to the "unfortunate infant" who had imbibed three full doses of the fictitious dill, and was consequently suffering from active inflammation, to be rather overdrawn. I apprehend a full dose of Aqua Anethi to be the much hackneyed and always-to-be-trusted teaspoon. Not being a family man myself, I would not solemnly asseverate that three-tenths of a drop of Ol. Anethi would *not* cause active infantile inflammation; but, not being deeply versed in infantology, I am inclined to think that our friend has, in drawing his deductions in this instance, "drawn the long bow."

I am, Sir, yours faithfully,

D. Watson.

Kettering, January 20, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

There are few persons going, I believe, who do not agree as to the necessity of sometimes praying to be delivered from their enemies, but unfortunately circumstances occur when, I think, it becomes equally necessary to pray to be delivered from our friends. I have read with some surprise, in the Journal of last month, an article by Mr. Ince on "A New Development" (a very appropriate term for the subject certainly), but I cannot help thinking, Sir, if pharmaceutical development is to be carried out according to Mr. Ince's ideas, the sooner the Pharmaceutical Society ceases to develope the better.

About Mr. Ince's remarks as to the style of chemists' shops in general, viz. "some handsome, others ugly in the extreme," etc., I have nothing to say, except that Mr. Ince should remember that chemists, as well as other people, are often the victims of circumstances, and moreover, that "those who live in glasshouses should not throw stones." But, Sir, lest the medical profession and others who read the Journal (as well as ourselves) may be misled by the statements in Mr. Ince's letter, will you allow me to contradict *in toto* his assertions, viz. that the majority of chemists are obliged to be dependent on others for such preparations as tinctures, ointments, waters, and extracts, merely for this simple reason, that they have not large laboratories, fitted up with immense "stills" and evaporating pans? That there are some who may

depend on others for such preparations, I am quite willing to allow, but that is a matter of choice, not of downright necessity. (I allude of course to those who are supposed to understand their business.)

But, Sir, why does not Mr. Ince give us a little useful information which we may turn to some account? For instance, he might have told us the amount of space requisite, and the probable cost of machinery sufficient to prepare, say, 5 or 6 lb. Cer. Cetacei, 3 or 4 pints Tinct. Rhei Co., 1 lb. Conf. Aromat. or Conf. Amygdalæ, and a little Sp. Rosmarini according to the Pharmacopœia.

Mr. Ince goes on to say, "I have great faith in a man and a pan." So have I, Sir, but I have much greater faith in a man with brains and a little ingenuity. Perhaps Mr. Ince has never had occasion to translate the following sentence, "Mater artium est necessitas;" I can only say I have, often, and can bear witness to its truth. Now, Sir, with reference to the formulæ of the Pharmacopœia, whether right or wrong, we have nothing to do; that book is handed to us for our guidance, therefore all we have to do is to work by it as conscientiously as we are able.

In reference to the *Vel* process for making distilled waters, Mr. Ince insinuates that the College has sanctioned a process for making them likely to destroy life (or nearly so, by his own showing), merely to suit the caprice of chemists, or else because they (the College) could not depend on their working honestly by the more difficult formula. I have no doubt this compliment will be appreciated as it deserves by the College, and also by the whole body of pharmaceutical chemists.

But, Sir, I should like to ask Mr. Ince one question, viz. has he prepared any of the vile compound carefully, according to the process of the Pharmacopœia; if so, if that is the article he has submitted to the microscope? for this reason, having made some of the vile compound myself, and having submitted it also to the microscope, I cannot discover any of the immense globules of oil floating about, of which he speaks with so much horror. Under such circumstances it is on the College Mr. Ince must lay the blame, not on those who carry out their instructions.

With the Dublin Pharmacopœia or its processes, Mr. Ince must know we have nothing to do at the present time, except under certain circumstances, where we have no formula in our own Pharmacopœia.

Now, Sir, with all due deference to Mr. Ince, I maintain that his arguments are not quite consistent; for this reason, if it be necessary for the Society to turn manufacturers of the preparations to which he refers, so also is it necessary that it should prepare every article in the Pharmacopœia. Mr. Ince surely cannot deny that calomel, morphia, hydrocyanic acid, and in fact every preparation in the Pharmacopœia, is of equal importance with extracts and tinctures, etc. Should Mr. Ince reply, we have chemical manufacturers in whom we can put confidence, I reply also, so we have manufacturers of extracts, etc.; supply and demand go hand-in-hand; and even those chemists who do not feel disposed to take a little trouble for themselves need not experience any difficulty in obtaining genuine pharmaceutical preparations.

But, Sir, depend upon it, if the Pharmaceutical Society intends to maintain its present position and popularity among all classes (from the Government downwards), it must not soil its reputation by making extracts. As well might we expect the College of Surgeons to make their own surgical instruments.

Apologizing for taking up so much valuable space,

Yours truly,

B. M. Johnson.

70, *Tottenham Court Road.*

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—On looking through the table of contents of the present number of your Journal, my attention was at once attracted to the "new development" of Mr. Ince; and on perusal, I was greatly surprised to find that gentleman deliberately inviting the Society to become *a trading body*, on the ground of its being, in that capacity, an essential boon to its members. If there are but few retail establishments with laboratories attached, does it in any measure follow that there are no other reliable sources of supply, or that every pharmaceutist may not at his pleasure obtain "distilled waters, extracts, spirits, and tinctures," without a doubt that, at a fair remunerative price, he can secure them equally true, and perhaps prepared with even greater care than he himself, from his position and occupation, could possibly bestow? Mr. Ince would infer, and lead the Pharmaceutical world to believe, that there are no consciences beyond the retail trade, nor any members of the Society to be trusted in the manufacturing department apart from the Council; and further, that his "great faith in a man and a pan" has met with no development elsewhere than in the branch pharmacy over which he presides.

The remarks of your correspondent are generally facetious, and tend to enliven the pages of the Journal, but with all deference I must submit that his present idea is "too romantic," and also inform him that, fortunately, the majority of the members of the Society, and others, are already aware that they can "obtain at a fixed price" all the "leading Pharmaceutical preparations which they are manifestly unable (or would find it undesirable) to manufacture for themselves." The blind faith in certain wholesale houses, manifest in the times of our fathers, does not now exist; for every one is, or should be, qualified to judge of the quality of all the preparations he purchases, and competition is too strong already (without inviting fresh enterprise) to leave any reasonable doubt on the mind of the purchaser that every care will be taken by the manufacturer to produce the most reliable result; conscious that on the actual merit of his productions his success can alone depend.

I feel that this notice of the paper in question needs no apology, because it is a direct attack, by implication, on the wholesale trade; but it is, at the same time, too evident a fallacy to require an extended refutation, and therefore I need not further trespass on your space.

I am, Gentlemen, your obedient servant,

G. B. Francis.

London, 11, *Old Fish Street*, *E.C.*, *Jan.* 17, 1863.

MANUFACTURE OF KELP AND IODINE.

(*Medal awarded to* Mr. E. C. C. Stanford *for his Researches and Improvements in this branch of manufacture.*)

At a meeting of the Society of Arts held on the 19th of November last, Sir Thomas Phillips in the chair, the Society's silver medal was presented to Mr. E. C. C. Stanford, F.C.S., Assistant Demonstrator in the Laboratory of the Pharmaceutical Society, for his paper "On the Economic Uses of Seaweed." An abstract of this paper has already appeared in the 'Pharmaceutical Journal' (vol. iii. 2nd series, p. 495). In referring to the recognition of Mr. Stanford's work by the Society of Arts, the 'Chemical News' says, "We do not remember that the Society of Arts has ever given a medal where it was so well deserved as by Mr. Stanford; the labour spent in prosecuting the experiments, the results of which were detailed in the paper, will bring the author, we hope, still more substantial reward."

FIR-WOOL OIL AND FIR WOOL.

("*Ol. Pini Sylvestris.*" "*Laine de Bois.*")

This oil, prepared by distillation from the finer leaves of the *Pinus sylvestris*, is now being imported into England from the manufactory of Messrs. Schmidt and Co., of Remda, on the Thuringian forest. It has long been approved of by the leading members of the German faculty, including Dr. Hopp, Professor of Medical Science in Basel; Dr. Paul Niemeyer, in Magdeburg; Dr. Hensehkel, in Kaltennordheim; Dr. Pauly, in Tost, and Dr. Bajakowsky, in Rosenburg. It has lately been favourably noticed in the 'Lancet;' and in 'L'Officine,' by Dorvault, page 549, the following passage occurs:—"In Germany, a wool is chemically prepared from the *Pinus sylvestris* (Holz-wolle, Laine de Bois). In the preparation of this wool, an ethereal oil (*Baume de pin*), of an agreeable odour, is produced, which is successfully employed against gout, rheumatism," etc.*

METHOD OF ASCERTAINING THE PRESENCE OF POPPY OR OTHER SICCATIVE OIL, IN OIL OF ALMONDS OR OIL OF OLIVES.

BY M. WIMMEC.

It is well known that the olein of the siccative oils is distinguished from the olein of those which retain their fluidity, by the fact that the former is not convertible into elaidic acid, and consequently does not become solid. M. Wimmee has proposed a convenient process for the formation of elaidin, which may be employed in testing for siccative oils in oil of almonds or oil of olives. Nitrous acid gas is generated by acting on iron filings with nitric acid; the gas is conducted by a delivery tube into water, on which a portion of the oil to be tested is placed; if but a small portion of oil of poppy be present, it will be found in drops on the surface, the remainder being entirely converted into crystalline elaidin.—*Journal de Pharmacie.*

PROCESS FOR OBTAINING METALLIC COPPER IN FINE POWDER.

BY M. HUGO SCHIFF.

To obtain metallic copper in a finely-divided condition, a certain quantity of a saturated solution of sulphate of copper is mixed with the same salt in coarse powder, granulated zinc added, and the mixture strongly and constantly shaken. The zinc takes the acid from the copper, and the latter is set free in a finely-divided powder. As a certain portion of the sulphate of copper in excess continues to dissolve, the decomposition proceeds as long as any copper remains in solution. By this method large quantities of pulverulent metallic copper may be quickly obtained. When sufficient has been produced, it is collected on a filter, washed repeatedly with water deprived of air, and lastly with alcohol. It is dried by expression, out of contact of air, without heat, the metal in this state being very prone to oxidation. During the reaction heat is developed, which singularly promotes the decomposition, and becomes so intense that after a few minutes the bottle cannot be retained in the hands.—*Journal de Pharmacie.*

A CRYSTALLINE PRINCIPLE DERIVED FROM THE *EUONYMUS EUROPÆUS.*

BY. M. KUBEL.

This principle is found in the cambium of the *Euonymus europæus.* The larger branches are selected in the spring; the green external bark is removed; the under layer is then scraped off with a knife until the wood is reached, and the scrapings macerated in strong alcohol. This tincture is allowed to stand half an hour, then expressed, and left to spontaneous evaporation. Crystals are deposited, which greatly resemble those of mannite. A second crystallization from alcohol and treatment

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* See also Pharmaceutical Journal, vol. iii. 2nd ser. p. 29.

with animal charcoal, yield them in a state of purity. The substance thus obtained is in small crystals consisting of microscopic needles, derived from an oblique rhombic prism. Insoluble in absolute alcohol and in ether, they are dissolved by cold, and are very soluble in hot water. The solution has no action on litmus paper, and does not appear to alter a ray of polarized light. The crystals contain no water of crystallization, and do not lose weight even at 110° Cent.; at 182° Cent. they fuse, and again solidify on cooling. The substance burns with an odour of caramel when ignited on platinum foil; it does not reduce tartrate of copper, even after ebullition with sulphuric acid, but it reduces the salts of silver.

All these characters, except the crystalline form and the fusing-point, accord with those of mannite. The centesimal composition is also the same, $C_{12}\,H_{14}\,O_{12}$. From the difference in crystalline form and fusing-point of the two substances, the author does not admit their identity, but gives the name of 'euonymite' to the new product.—*Journal Prakt. Chem.*

PREPARATION OF BISMUTHIC ACID.

BY MM. BŒDEKER AND DEICHMANN.

When a solution of nitrate of bismuth is treated by a concentrated solution of cyanide of potassium added in excess, a dark brown powder is precipitated, and the solution becomes coloured red.

This brown precipitate, which has hitherto passed for $Bi\,O_4$, is, in fact, hydrated bismuthic acid, $Bi\,O_5 + 2\,HO$. It is purified by boiling and washing in distilled water; unless this precaution is observed, the product retains a little cyanide of potassium. The water of hydration is not given off till the heat employed reaches 150° C. The bismuthic acid is not produced by the cyanate of potash that the cyanide may contain; by direct experiment the authors were assured that the pure cyanate gives no such reaction.—*Chem. Centralblatt.*

PRODUCTION OF ACETYLENE FROM CARBIDE OF CALCIUM.

BY M. WŒHLER.

By exposing to a very high temperature a mixture of powdered charcoal with an alloy of zinc and calcium, carbide of calcium is produced; this compound decomposes in the presence of water, and furnishes hydrate of lime and acetylene, $C_4\,H_2$, to which the researches on the synthesis of the hydrocarbons by M. Bertelot have directed lately so much attention.

M. Wœhler has not yet submitted the gas to analysis, but from the complete identity of its reactions, he is not the less certain that it is the same body. Thus, it burns with a brilliant and smoky flame; it detonates with chlorine, even in diffused light, with a bright flash, and deposits carbon; it also furnishes an explosive powder, with an ammoniacal solution containing silver.—*Ann. der Chem. und Pharm.*

MISCELLANEA.

Alleged Poisoning by Arsenic.—On Friday, January 2nd, an adjourned inquest was held at Ravesby, near Horncastle, Lincolnshire, respecting the death of Jemima Garner, an elderly woman. The inquiry was conducted before Dr. Clegg, coroner for the district. From the evidence adduced, it appeared that on the death of the deceased, some months since, suspicion attached to her grandson, John Garner, of Marcham-le-Fen, and his wife (formerly his servant), in consequence of their cruel treatment of the old woman, who had lived with Garner since the death of his former wife; and the prisoners were arrested on the charge of administering poison to, or causing it to be taken by, the deceased, Jemima Garner. The body was exhumed in November last, and a *post-mortem* examination was made by Dr. Boulton, of Horncastle, and Mr. George, surgeon, of Ravesby. This examination showed that the tissues of the spine, the coat of the stomach, and muscles of the abdomen were deeply

tinged with a bright yellow colouring matter. The whole was placed in jars by Dr. Boulton, and forwarded to Dr. Taylor for analysis. From Dr. Taylor's report it appears that arsenic was found in considerable quantity in the form of the yellow sulphide, as well as that of white arsenic. The following are the results of the analysis made by Dr. Taylor:—1. That arsenic was present in the stomach, intestines, liver, and heart of the deceased, in all the parts of these organs submitted for examination. 2. That the arsenic was contained in the stomach, intestines, and in the flesh and ligaments of the spine, partly in a soluble and partly in an insoluble form,—that is, as orpiment, or yellow arsenic. 3. That the orpiment, or yellow arsenic, which causes the patches of colour in the stomach, bowels, and in the spine, has probably been produced by a chemical change in the white arsenic contained in the stomach and bowels at time of death. 4. That the yellow stains found on the spine were produced by arsenic escaping through the coats of the stomach after death, and the yellow stains on the mesentery were caused by arsenic escaping through the coats of the intestines. 5. That the quantity of yellow arsenic altogether was probably not less than six to eight grains, equivalent to form five to six grains of white arsenic. 6. That the discovery of arsenic in the substance of the liver and heart renders it probable that the deceased had taken the poison some time,—that is, one or two days before death. 7. That the quantity found in the body would be fatal to a human being, and in the absence of any other apparent cause, would be quite sufficient to account for death. A small quantity of arsenic was also found in some of the earth from the grave, but it was in a form perfectly insoluble in water, and could in no way account for the arsenic found in the body of the deceased. In consequence of a warrant from the Secretary of State, the body of Hannah Garner (first wife of the male prisoner) has been exhumed, and a *post-mortem* examination made by Drs. Boulton and Clegg. Portions of the body were also sent to Dr. Taylor, and on analysis were found to contain arsenic, although not in so large a quantity as in the case of the body of Jemima Garner. The prisoners were again brought before the magistrates on Wednesday, January 15, when the evidence of Dr. Boulton, who, with the assistance of Dr. Clegg, had made the *post-mortem* examination of the body, and that of Dr. Taylor, who had examined the viscera, was adduced. Dr. Taylor stated that he discovered half a grain of arsenic in a soluble form in the portion (one-fourth) of the stomach examined, and a quarter of a grain in the portion of the liver. A small portion of arsenic was also found in the heart and in the kidney. Dr. Taylor concluded that arsenic, although in small quantities, was distributed throughout the body, and that its presence and quantity were consistent with the death of the deceased by arsenic. The prisoners were committed for trial on both charges.

Poisoning by Strychnine.—On Monday, January 5, Dr. Lankester held an adjourned inquiry at the Middlesex Hospital, respecting the death of George Heimsath, aged forty-three, a porter, in the employ of Messrs. Hopkins and Williams, wholesale chemists, New Cavendish Street. The facts elicited were that the deceased and three other men had some beer at their place of employment, on Christmas Eve; a portion of this beer was left, and was put into a gallon glass bottle by May, one of the men referred to, who placed it under the counter in the sealing room. About ten o'clock on the morning after Christmas Day, the deceased and another man drank some of the beer that had been left, and almost immediately afterwards Heimsath was found in convulsions, and was conveyed to the hospital, where he quickly died. The other man (Collis), who had taken only a small quantity of the beer, was seized with vomiting, and tightness in his legs, but soon recovered. The deceased was seen by Dr. Devereux, who stated that after the administration of an emetic, spasms set in, the head being bent over the back of the chair. A relaxation of the spasms gradually took place, the heart's action and respiration ceased, and he died ten minutes after being brought in, from tetanus. In the beer that had been forwarded to Dr. Devereux about 2½ grains of strychnine, and in half a pint of the beer analysed by Dr. Taylor 1·84 grain of pure strychnine, were found. Mr. J. Williams, of the firm in which deceased was employed, stated, that the strychnine was kept in a room on the same floor as the sealing room, but partitioned off. All the men had access to it. He found a bottle containing strychnine, with some of that poison spilt on the lip of the bottle. It had not been required for use for some time. The jury returned the following verdict:—

"That George Heimsath died from tetanus, through taking strychnine, but whether it was placed in the beer by himself or by any other person there was no evidence to show."

Poisoning by Veratrum Viride.—In the 'Medical Times and Gazette,' of January 3rd, a case of poisoning by green hellebore is reported by Dr. G. N. Edwards, who was summoned to see a gentleman, a scientific chemist, who had taken, experimentally, one drachm of the tincture of *Veratrum viride* (equal to about 12 grains of the powder). The symptoms were—vomiting; skin cold, and covered with a profuse clammy sweat: his pulse quite imperceptible. An ounce and a half of pure brandy was administered, which checked the vomiting. A dose, consisting of Sp. Ether. Sulph. Co. ʒss, and Sp. Ammon. Arom. ʒi., was given, but immediately rejected by the stomach; but some brandy, given directly afterwards, was retained. A large mustard poultice was applied to the epigastrium, and a hot-water bottle to the feet. Warmth gradually returned to the surface, and the patient fell asleep for about a quarter of an hour, and awoke comparatively well. The above is the first authenticated case of poisoning by green hellebore.

Death from an Overdose of Prussic Acid.—An inquest was held at Waterford, on Saturday, December 27, respecting the death of Mr. Sawyers, surgeon of the 86th Regiment, which took place suddenly on the previous day. Mr. Sawyers had been in the habit of taking small doses of prussic acid, and on the day mentioned, he felt unwell, and told his servant that he would not go to dinner. The servant laid on the table a bottle containing prussic acid, and another containing essence of peppermint, and it is supposed that he took the prussic acid in mistake. The jury returned a verdict to the effect that death was caused by an overdose of prussic acid.

Death from Croton Oil.—At Belfast, January 7, Samuel Gibson, who keeps a druggist's shop, was brought up before the magistrates, charged by one of his assistants with having sold croton oil, instead of syrup of squills, to Patrick Gordon, who administered it to Susan Gordon, an infant, from the effects of which she immediately died. Informations having been sworn against Samuel Gibson, the magistrate returned him for trial at the quarter sessions now going on. An inquest was held on the body of the child on the 17th of December, and a verdict returned that the death was caused accidentally; but this not having satisfied the parent, the case was brought before the magistrates, with the above result.

Deaths by Fire.—Many deaths of ladies by fire have recently occurred, and the public has been recommended to apply to chemists for substances wherewith to render muslin and other dress-materials uninflammable. We would therefore remind our readers that tungstate of soda is the best agent for this purpose, the fabrics being immersed in a solution of one pound of this salt in a gallon of water, or in a still stronger solution if the article requires to be tightly "wrung" before drying. Dresses, etc., to be starched, may be immersed in a stiffening mixture prepared from starch to which about one-fourth or one-third its weight of tungstate of soda has been added. A 10 per cent. solution of sulphate of ammonia has also been recommended as an anti-inflammable liquid, and it succeeds very well, but articles prepared with it cannot be ironed with facility.*

Death from Oil of Vitriol.—On Sunday, January 18th, John Willan, employed in the gas-works in Preston as foreman and attendant to the ammonia still, met with his death under the following circumstances. It was his duty to supply the still with oil of vitriol, which he had to pour from carboys holding about ten gallons each, and in order to do this, he had to ascend a platform raised to a level with the mouth of the retort, and it is conjectured that in the act of doing this, he slipped off the platform, and in his fall must have dragged the carboy with him, the liquid pouring down upon his face and chest. He was found lying on the ground under the platform, in a pool of oil of vitriol, which was gradually consuming his body. Medical aid was procured, but it was of no avail, and the unfortunate man expired in great agony.

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* See vol. i., 2nd series, pp. 385 and 422.

BOOKS RECEIVED.

The Half-Yearly Abstract of the Medical Sciences. Edited by W. H. Ranking, M.D., and C. B. Radcliffe, M.D., etc. July—December, 1862. London: John Churchill, New Burlington Street.

Excessive Infant Mortality; How can it be stayed? A Paper contributed to the National Social Science Association; to which is added, a short Paper reprinted from the 'Lancet,' "On Infant-Alimentation," etc. By M. A. Baines. London: John Churchill, New Burlington Street; Messrs. Booth, Regent Street. (From the Author.)

A Manual of Animal Physiology, for the Use of Non-Medical Students, with an Appendix of Questions, etc. By John Shea, M.D., etc. London: John Churchill, New Burlington Street. 8vo, pp. 240. 1863.

The Pharmaceutical Almanack for 1863. By A. W. Digby and Co., Chancery Lane. We call attention to this Almanack, as containing, besides the usual information to be found in such compilations, much that is useful to the Pharmaceutist in particular. Each month has its memoranda of plants, etc., to be gathered for use; and as it is not an infrequent occurrence that some particular plant is forgotten until too late to be obtained in its proper condition, a daily reminder of those most generally required may be of use. The Pharmaceutical chemist is also reminded when his subscription to the Society is due, as well as when "partridge-shooting begins;" but in place of the latter, it might have been more appropriate, although not so pleasing, had he been informed that his *Patent Medicine Licence* was due. We would suggest that this information, as well as that the Licences for the "Use of Stills" and for the "Sale of Methylated Spirit," become due on the 5th of July.

TO CORRESPONDENTS.

Powerful Oxidizing Mixture.—With reference to a paragraph in our last number, by M. Bœttger, on the property possessed by a mixture of oil of vitriol and permanganate of potash, this property appears to have been previously described by Mr. Condy, who, in a pamphlet 'On the Purification of Water, and the Use of the Alkaline Permanganates as Purifying Agents,' states that "on passing a current of air through this mixture, by means of a pair of bellows or some more special contrivance, it will be found to possess the odour and reactions of ozone."

Veritas (Carlisle).—The terms are synonymous. See vol. i. 2nd series, pages 305 and 343.

V. S. (Carlisle).—Morton's 'Manual of Veterinary Pharmacy.'

J. G. (Coventry).—Candidates for the Minor Examination should possess a knowledge of the elementary structure of plants, and of the general characters and structure of the organs of nutrition. They are also expected to be able to recognize the more important medicinal plants which are officinal in our Pharmacopœias.

C. J. D. Russell (Windsor) will find an account of *Hydrocotyle asiatica* in the 'Pharmaceutical Journal,' vol. ii. 2nd series, p. 144.

W. T. B. (Brecon).—The annual subscription to the Pharmaceutical Society is one guinea for Members, and half a guinea for Associates and Apprentices,—with the free issue of the Journal.

M. P. S. (London) is thanked for his communication.

Ascanius should apply to the Secretary for the regulations of the Board of Examiners.

M. P. S. should send the label.

Charles Symes, in our next.

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. IX.—MARCH 1st, 1863.

"'FORWARD' IS THE MOTTO, AND '*EDUCATION*' IS OUR WATCHWORD."

A typographical error which occurred last month in our article on the opening of the Leeds Chemists' Association, gives occasion for a few remarks on the subject of pharmaceutical qualification in Great Britain. It may have struck some of our readers that a perusal of the admirable address of Mr. Harvey would certainly have suggested a better watchword than "elevation," which we were made by our printer to put forth. Elevation may indeed be the aim and end of our exertions; but while we wished "Forward," as a motto, to be the aspiration of our body, we certainly desired by our watchword to express the means whereby alone we could go forward, the password necessary for each aspirant at the barriers by the way, and clearly no other word could be as appropriate as "Education."

And this leads us to consider the course taken by our Society for the advancement of Pharmacy, and the welfare of those who practise it. We will not speak now of those improvements in our social condition which union has enabled us to achieve, but rather of the rules ordained to carry out the suggestions of our Charter, and the enactments of the Pharmacy Act; endeavouring to show that the suggestions, enactments, and rules, all tend to the better qualification of pharmaceutists, and the safety of the public; "*advancing Chemistry and Pharmacy, and promoting an uniform system of education of those who should practise the same,*" by "*examining all persons who shall present themselves for examination under the provisions of this Act in their knowledge of the Latin language, in Botany, in Materia Medica, and in Pharmaceutical and general Chemistry, and such other subjects as may from time to time be determined by any Bye-law.*"

Taking then our apprentices' test first in order, it must be obvious to all that a certain acquaintance with the Latin language, an ability to express themselves decently in the mother-tongue, and enough knowledge of arithmetic to compute proportions, are the necessary qualifications for boys on the very threshold of the business. Some may object that this, which is called the "*Classical Examination,*" goes scarcely far enough; we must confess the title is somewhat too pretentious for so simple an affair; but in arranging it, the Council had many points to consider, and in prescribing that which was compulsory under the Act of Parliament, and that which was absolutely necessary in practice, it was desirable not to alarm those who would enter. We think none can say that the cord is stretched too tightly, and we hope no master would sign indentures with an apprentice falling short of the standard. With such educational advantages as are to be obtained now, there can be no excuse for doing so, and most assuredly the interest of the master lies all the other way; it is his duty to instruct his pupil in the science and mystery of chemistry and pharmacy, not in arithmetic and the Latin grammar. The student should bring these straight from school, and at no future time would he, under ordinary circumstances, be so well able to pass an examination on such subjects. This is altogether free from professional knowledge, and con-

sequently the certificate of a non-professional examiner, approved by the Council, is sufficient. In all cases it is provided that the Examiner shall not have been also the teacher of the applicant. For the good of all concerned, then, it is desirable to make this the time of the first step, and having ensured a good foundation, we pass on to the first *professional*, or "Minor Examination."

An interval has elapsed, passed by the student in the ordinary duties of a Chemist's establishment; and making all allowances for difference in masters, varieties in business, and greater or less opportunity for improvement, we believe still it will depend very much on himself whether or not he can go through the second ordeal. He is now required to understand prescriptions thoroughly, dispensing such as the examiners may put before him, rendering the prescriber's directions in plain and distinct terms to the patient; to recognize the medicinal plants of the Pharmacopœia, and possess some knowledge of botany; to recognize also various parts and products of plants contained in the Materia Medica of the Pharmacopœia, and to give some account of their history and uses; also, to be acquainted with the galenical and chemical preparations of the Pharmacopœia. The Pharmacopœia is the text-book of the Examiners, and the apprentice has at least had that in his hand for the four or five years preceding.

Another period has passed, and our associate has probably spent two years in London, where physicians' prescriptions are more common, and oils and colours have no place in chemists' shops; he may also have availed himself of the opportunities offered by the Society, by attending lectures on chemistry and pharmacy, or botany and materia medica; he may have spent a leisure hour now and then in the library; or have added to his other advantages a course of instruction in the laboratory. But even supposing he has not been able to use either lectures, library, or laboratory for his improvement, he has at any rate enlarged his experience, he has seen the working of another establishment,—if better than his former, to profit by its example; if inferior, to be warned by its shortcomings,—he has had more responsibility thrown on him, perhaps felt the anxiety incident to the life of a careful dispenser; he has seen that even physicians are fallible, and that if patients *will* talk while doctors *must* write, an extra inflection of the pen will occasionally convert a drachm into an ounce, and he is the safeguard to detect the error and prevent mischief; and surely this experience should bring him up to the condition necessary for passing a *good, sound, practical* examination, which the last, or *Major examination*, really is. It goes more fully into the subjects enumerated in the Minor, superadding such a knowledge of the nature and power of medicines as will enable the dispenser at once to detect inferior quality or excessive doses, and be on his guard for the inaccuracies which occasionally come before him; as well as a sufficient acquaintance with the tests and antidotes for ordinary poisons to render him a safe referee in cases of emergency.

We have been thus careful to describe these various stages for three reasons:—First, because the Pharmaceutical Society having received powers, privileges, and a great trust from the State, we were anxious to show that it had neither abused the one nor neglected the other; that in advancing its own body, it had only done so by increasing the public safety. Secondly, that Chemists and Druggists who stand aloof, declaring us to be exclusive, should have the opportunity of pointing out, if they can, any one non-essential barrier to their admission to the Society. And lastly, because it is well that we who are bound together in the Pharmaceutical Society, and have each a share of duty to perform, should from time to time review the principles of our institution; never forgetting that union is strength, and that difficulties which to individuals may appear insurmountable, may be overcome, as others have been, by our united exertions.

THE TWO SOCIETIES.

Our contemporary, the 'Chemist and Druggist,' has, in its last two numbers, devoted a certain space to observations on our remarks of Jan. 1, regarding the Manchester Manifesto of the United Society of Chemists and Druggists. The first commences by stating a preference for the qualification test of the Pharmaceutical Society (a certain amount of knowledge) to one proposed for the United Society (a certain term of apprenticeship), and ends by declaring the want of the Chemists and Druggists to be, a society "*able to elevate them in the public estimation above the level of ignorant dealers in drugs, by means of a voluntary system of education. They need no artificial distinction nor arbitrary test, but they demand a college or school which shall furnish the rising generation of Druggists with the qualifications which are essential to public confidence.*" It would really be ungracious to criticize an article which begins with so high a compliment as the adoption of one of our fundamental principles, and concludes by expressing an opinion we have upheld for the last twenty years. If the dose administered by our friend had been ever so bitter, this careful wrapping in wafer-paper would have carried it clean over our palate either with or against our will.

But now Mr. Buott comes in to shield the United Society from its "*Traducers,*" and begins by setting forth certain resolutions which were agreed to at Manchester, to prove that others, from which we drew our conclusions, were misinterpreted by us. As he has given the former, we will now quote the latter; and whether we look at them "in the light of his voluntary principles," or otherwise, we read that after a certain date members are not to be admitted without examination, and we very confidently submit that that day will begin the arbitrary or compulsory system which, according to Mr. Buott, "*is to foster a tyrannous oligarchy in a free country.*" We by no means find fault with the United Society on this head; on the contrary, we know it is the only possible course to be taken in furtherance of what we must still call the altered views of the Society. Here are the propositions to which we refer, issued by the Manchester Committee, and signed by "J. G. Gibbon, Hon. Sec."

1. To receive as members those only who can with justice be termed "Chemists and Druggists."
2. To apply to Parliament for a Charter of Incorporation.
3. To devise a simple but effectual mode of Examination.
4. To establish a Board of Examiners, from which all future Candidates must obtain a certificate of efficiency.
5. To fix a time, after which Examination must be the test of Membership.
6. To consider the desirability of making a provision for our necessitous poor.

Mr. Buott next alludes to our statement *that his Society was established without reference to education and qualification*, and assures us it was not; but says, "*On the contrary, we intended from the first that a Chemists and Druggists' College should be the crowning-stone of our institution.*"

Having the published "*Objects*" of the Society now before us, we find six especially enumerated, not one referring to this subject; but in a note it appears, "*It is intended also, as the Society progresses, to establish schools for the children of Members.*" Now we take it such schools would have about as much reference to the education and qualification of Chemists and Druggists, as the many excellent schools supported throughout the country by the "Worshipful Company of Fishmongers" have to the sale of soles and salmon.

As to the services the Pharmaceutical Society has rendered to the trade, we will say no more; our own Members know and appreciate them; some of Mr. Buott's supporters speak highly of them also, and we hope he will himself live long enough to witness the general acknowledgment that through evil report and good report it has laboured earnestly and successfully for the advancement of Pharmacy, and those who practise it.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *February 4th*, 1863,

Present—Messrs. Bird, Bottle, Davenport, Deane, George Edwards, Evans, Hanbury, Haselden, Herring, Hills, Lescher, Meggeson, Morson, Sandford, Savage, Squire, and Standring,—the following were elected

MEMBERS.

BATH .....Ekin, Charles.
BRIGHTON .....Savage, William Wallace.
BRISTOL .....Boucher, John
LONDON .....Ince, Joseph.
LONDON .....Guesdon, Victor.
LONDON .....Weaver, Thomas Tomkins.
SCARBOROUGH.....Whitfield, John.

ELECTION OF THE COUNCIL.

The following Members of the Council were drawn by Lot to remain in office for the ensuing year :—

Bucklee, William Henry .....86, New Bond Street.
Deane, Henry.....Clapham.
Evans, Henry Sugden .....52, Hanover Street, Liverpool.
Mackay, John.....121, George Street, Edinburgh.
Meggeson, George .....Wandsworth.
Squire, Peter .....277, Oxford Street.
Standring, Thomas.....1, Piccadilly, Manchester.

USE OF METHYLATED SPIRIT IN PHARMACY.

The substitution of Methylated Spirit for pure Spirit of Wine in Pharmacy was again discussed, and it was ordered that the following protest should be published in the Transactions, together with the opinion expressed on the same subject by the College of Physicians.

The attention of the Council having been directed for some time past to the use in pharmacy of methylated spirit, in the place of pure spirit of wine, they think it incumbent upon them, as the representatives of a Society founded for the promotion of pharmaceutical science in this country, to declare their opinion that such substitution is highly undesirable.

Methylated spirit is a compound of pure spirit of wine to which one-tenth of its volume of imperfectly purified wood-naphtha has been added, the object of such addition being that of rendering the mixture *unpotable* through its offensive odour and taste. This spirit, being sold duty-free, can be employed by the chemical manufacturer as a solvent in many processes, for which, from its greater cost, duty-paid spirit would be commercially inapplicable. But in the preparation of those medicines which contain spirit as the vehicle or menstruum by which more active substances are administered, the employment of a compound so uncertain and offensive as methylated spirit is, in the opinion of the Council, highly improper, and by no means to be justified upon the plea of its lower cost.

The Council desire to draw the attention of Pharmaceutical Chemists to these facts, and earnestly request their co-operation in discountenancing such a substitution.

The following opinion was expressed, in 1857, by the Pharmacopœia Com-

mittee of the Royal College of Physicians, to whom the subject was referred by the President of the College.

We are of opinion,—

1. That wood-spirit, of which methylated spirit contains ten per cent., is a variable preparation, containing an uncertain quantity of empyreumatic oils of a noxious kind.

2. That the manufacture and sale of methylated spirit have been permitted by the Legislature expressly on the ground that it is so nauseous that it cannot be substituted for, or used in place of, ardent spirits.

3. That preparations ordered in the London Pharmacopœia, when made with methylated spirit, differ materially in appearance, odour, and taste from the same when made with rectified spirit, and for the most part retain so much of the nauseous odour and flavour of wood-spirit, that they are liable to occasion the nausea, headache, and other disagreeable symptoms, which its empyreumatic oils, whether taken into the stomach or diffused in vapour and inspired, are known to produce.

4. That permission to use methylated spirit in some officinal preparations would act as an encouragement to its surreptitious use in others in which it was not authorized.

5. That there is no reason for the use of methylated spirit in the preparation of medicines, except the insufficient reason of its greater cheapness, which would be more than counterbalanced by the inferiority and noxious quality of the medicines thus prepared.

6. That, consequently, the substitution of methylated for rectified spirit in *any* of the processes of the Pharmacopœia should be strictly prohibited.

The following subscriptions to the Benevolent Fund, amounting to £9. 13*s*., were announced as having been received in January :—

	£	*s.*	*d.*
Attwood and Hugill, Messrs., 61, Cannon Street	1	1	0
Barnes, Jas. B., 1, Trevor Terrace	0	10	6
Blake, Sandford, and Blake, 47, Pieeadilly	1	1	0
Bourdas, Isaiah, 10, Pont Street	1	1	0
Bradley, John, 21, Belgrave Road	0	10	6
Brown, Edward (Non-Member), Leeds	0	10	6
Buckle, Christopher F., Gray's Inn Road	0	5	0
Hooper, Bartlett, 43, King William Street	0	10	6
Parsons, William, Portsmouth	0	10	0
Polloek, T., 129, Fenchureh St.	1	1	0
Randall and Son, Southampton	1	1	0
Starkie, James, 4, Strand	1	1	0
Thomas, John J., Stoke Newington	0	10	0

A *donation* of one hundred pounds to the above Fund was handed to the Council from Mr. Edward H. Moscrop, 140, Strand.

MAJOR EXAMINATION, *February* 18*th*, 1863.

Fleteher, John ..... Camberwell.
Taylor, George Spratt ..... Harrogate.

MINOR EXAMINATION.

Allcoek, Christopher ..... Nottingham.
Downes, Robert ..... Stoekport.
Pasmore, Frederiek Rieh ..... Chelsea.
Peele, Henry Anthony ..... Durham.
Wyman, John Sanderson ..... Aleester.

CLASSICAL EXAMINATION.

Blacklock, Robert Hannah ..... Mr. Blacklock ..... Lochmaben.

PHARMACEUTICAL MEETING.

Wednesday, February 4th, 1863.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society awarded to the respective donors thereof:—

The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.
The Photographic Journal.
The Technologist.
The Educational Times.
The Sculptor's Journal.
Répertoire de Chimie.
Le Moniteur Scientifique.
The New York Journal of Materia Medica. From the respective Editors.
The Journal of the Chemical Society.
The Journal of the Society of Arts. From the respective Societies.
A Dutch translation of Ambrose Paré's Treatise on Surgery and Medicine of the Sixteenth Century. From Mr. George Whipple.

A Photograph, by Mr. Greenish, of an early advertisement of Dr. James's Powder. Presented by Francis Newbery and Sons.

Specimens of Cortex Laricis, Cortex Pereiræ, Hydrocotyle asiatica. Presented by Mr. Daniel Hanbury.

Folia Hyoscyami albi. From Mr. F. Pertwee, of Smyrna.

Samples of Metallic Arsenic and Sulphide of Arsenic. Presented by Mr. Balkwill, Plymouth.

The following Papers were read:—

ON THE PRODUCTION OF A PURE POTASH-SOAP, APPLICABLE TO THE PREPARATION OF CLARK'S SOAP-TEST.

BY C. H. WOOD, F.C.S.

Dr. Clark, in the description of his admirable process for determining the hardness of waters, directs the solution of soap to be prepared by dissolving about one ounce avoirdupois of Hawes's white curd soap in a gallon of proof spirit, and then accurately adjusting its strength, either by the addition of a little more soap or a little more spirit, until 320 grain measures are exactly sufficient to furnish a permanent lather with 1000 grain measures of the standard of hardness, which consists of 17·76 grains of dry chloride of calcium dissolved in a gallon of distilled water.

This process for testing waters has met with almost universal application, on account of its accuracy and the rapidity of its execution. To the pharmaceutist, who is constantly called upon to determine the suitability of different waters for domestic purposes, it is especially valuable, because it enables him, with a very small amount of apparatus and with very little trouble, to obtain as much information as he requires. Those however who are constantly using this soap-test must suffer from an inconvenience caused by the frequent separation of a portion of the soap from solution. In cold weather this takes place to a very considerable extent, and creates the necessity of warming the whole of the solution before using it. Quite recently, Dr. Clark's process

has been modified and extended by MM. Boutron Charlard and Boudet in France, and Mr. Edward Nicholson in this country. The first-named chemists recommend a much stronger solution of soap than Dr. Clark indicated, and in this case the inconvenience referred to is much increased; when cold, in fact, the solution becomes almost solid. This difficulty is avoided by Mr. Nicholson, by substituting soft-soap of the Pharmacopœia for the soda-soap generally employed. It is well known however that all potash-soap is necessarily impure; and that it is impossible to separate the excess of caustic alkali, the carbonate of potash, and other saline impurities, which are unavoidably introduced during the process of saponification. Sapo mollis therefore cannot be well suited for the preparation of a delicate reagent. Under these circumstances, it occurred to me to employ in this process a method I had previously devised for obtaining a perfectly pure and neutral potash-soap.

Although it is impossible to obtain a pure potash-soap by direct saponification, yet it is very easy to produce it by indirect means from the previously formed soap of another base. If, in short, any insoluble soap be treated with carbonate of potash, a double decomposition occurs, by which a potash-soap is produced. The most accessible and the purest insoluble soap for the purpose is the emplastrum plumbi of the Pharmacopœia, which consists of a pure and very definite lead soap, obtained by saponifying olive oil with oxide of lead. This body, treated with carbonate of potash in the presence of rectified spirit, yields at once insoluble carbonate of lead and a spirituous solution of a neutral* potash-soap. Both the plaster and the alkaline carbonate being insoluble in spirit, any excess of either remains insoluble. It is preferable, however, to ensure absolute neutrality, to keep the lead-soap in slight excess. The easiest method of proceeding consists in taking 150 parts of lead-plaster, and 40 parts of dry carbonate of potash, rubbing these in a mortar until they form a homogeneous mass, and then adding some rectified spirit, which dissolves the potash-soap formed; the liquid is then poured upon a filter to separate the carbonate of lead, and the precipitate washed with a little more spirit. If the spirituous solution so obtained be evaporated down and well dried by the water-bath, a soap is obtained which is entirely free from all the impurities necessarily present in ordinary potash-soap, and is moreover perfectly definite in composition. A comparative analysis made of the lead-plaster, and the resulting potash-soap, indicated that the lead in the plaster had been exactly replaced by its equivalent quantity of potash in the soap.

In applying this process to the preparation of Dr. Clark's soap-test, it is not of course necessary to evaporate the alcoholic solution. To make, for instance, a quart of the soap-test, 155 grains of lead-plaster are rubbed in a mortar with 40 grains of *dried* carbonate of potash, and a few drops of spirit, the resulting mass is treated with several ounces of rectified spirit, and then filtered; the precipitate is well washed with more spirit, and the solution made up to the bulk of one pint. One pint of pure and *well boiled* distilled water is then added, in order to bring it to the strength of proof spirit. The solution is then tried with the *standard of hardness*, and if too strong, more spirit is added, or if too weak, some alcoholic solution of soap from fresh materials must be prepared and added, until the exact point is attained, just, in fact, as in the ordinary method. It is necessary to keep the soap-test so prepared from free contact with the air, as the access of carbonic acid causes an opalescence, due to the decomposition of a portion of the soap.

The Chairman inquired of Mr. Wood, whether he proposed his soap-test as an improvement on Dr. Clark's in any other respect than that of its remain-

* By "neutral" is meant free from any excess of alkali; the soap, of course, presents an alkaline reaction upon vegetable colours.

ing soluble at all temperatures. He, the Chairman, had some years ago had frequent occasion to work with Dr. Clark's soap-test, and had brought it under the notice of the Society at that time.

Mr. Wood said the action of the test prepared as he had described was identical with that made by Dr. Clark's process; the only difference was in the solubility of the soap.

Dr. Redwood thought, as reference had been made to Mr. Nicholson's proposition for applying the soap-test to the quantitative analysis of water, it might be as well to state that Mr. Nicholson's paper was published in a recent number of the Journal of the Chemical Society.

ON A METHOD OF DISSOLVING ALKALOIDS IN OILS.

BY DR. ATTFIELD,

Director of the Laboratory of the Pharmaceutical Society.

Solution of Quinine in Cod-liver oil is now well known as a remedial agent. The sulphates of quinine are insoluble in oils, but the alkaloid itself is soluble to the extent of about two grains in one ounce of oil. I believe the solution is made by simply adding the quinine to the oil, and either frequently agitating or applying heat till dissolved, or by first dissolving the quinine in alcohol, adding this liquid to the oil, and then heating the mixture till the alcohol has volatilized. By either process only two grains of quinine can be dissolved in an ounce of oil, and the operations are tedious. Exposure to air and heat sets up a tendency to rancidity, the preparation frequently darkens in colour, and the alkaloid is often redeposited.

On thinking over the above facts, the idea occurred to me that the *oleates* of the alkaloids, if such salts existed, would probably be readily soluble in oils. Experiment has proved the correctness of the supposition. The preparation of these compounds is exceedingly simple. All that is necessary is to bring together the oleic acid and the well-dried alkaloid, and digest for a short time at a temperature not exceeding 212°. The resulting oleates are oily fluids, miscible with oil in all proportions. They are insoluble in water, but soluble in alcohol, and have no more colour, odour, or taste than may be possessed by their constituents.

Solution of Quinine in Cod-liver Oil. About twice its weight of oleic acid is necessary to form a clear fluid oleate of quinine, the mixture being kept at the temperature of boiling water for an hour or two. Its solution in cod-liver oil is not, so far as I have observed, more prone to rancidity than the oil itself, nor is any quinine redeposited from the liquid. Oleate of quinine has the consistence of a soft resin, and is perfectly stable; any quantity of it therefore may be prepared at one operation, and the product be regarded as a concentrated solution of quinine to be diluted with oil whenever necessary, and to any required extent.

Quinidine, cinchonine, cinchonidine, morphine, thebaine, narcotine, strychnine, brucine, igasurine, veratrine, atropine, piperine, and solanine are, like quinine, slightly soluble in oil, the proportion being from one to three grains to the ounce of oil. Their sulphates and other ordinary salts are insoluble in oil, and, indeed, in oleic acid also; the free alkaloids however readily combine with oleic acid, forming compounds perfectly miscible with oil.

Though the above, and, doubtless, all other organic bases form definite oleates, their chemical power in this respect appears to be inferior to that of the inorganic bases; for I find that they—*i. e.* the natural alkaloids commonly met with—cannot take oleic acid from oil and liberate glycerin, as oxide of lead, potash, etc., do. About fifty grains of quinine was heated with three or four times its weight of olive oil for nearly an hour, water was then

added, and the whole boiled for a short time. On evaporating the aqueous portion of the mixture, a solid, bitter residue was obtained, but it had none of the characters of glycerin. In another experiment with quinidine no glycerin was obtained. This result might be expected, for were the solution of a few grains of alkaloid in an ounce of oil anything more than a solution, were it due to combination of the alkaloid with the acids of the oil, surely the process would not stop till far more than two grains had acted upon the ounce of oil. Of course, if such exceptional alkaloids as the artificial methylic and ethylic derivatives of ammonia, the hydrated oxide of tetrethyl-ammonium ($N\dot{E}t_4O$, HO) for example, be heated or even agitated with oil, true saponification does take place. Possibly also some natural alkaloid may yet be found having sufficient chemical energy for this purpose, but the ordinary natural ones certainly have not.

Inorganic as well as organic bases appear to combine with oleic acid, and form salts soluble in oils. I find that the oxides of lead, mercury, zinc, and iron dissolve in oleic acid when strongly heated, the products being freely miscible with oils and fats. Doubtless all bases form oleates, thus affording a means whereby such preparations may be administered internally or externally in a true state of solution in oils, ointments, or liniments.

I have not yet succeeded in crystallizing any of the oleates; but the above experiments are, I think, sufficient, to establish the fact of their existence, and this is a point of some slight chemical interest. The preparation of them is so simple, that, except in the case of quinine, I have given no details. But were the preparation difficult, I should hesitate to enter minutely into the matter, as at present I do not see any medical or pharmaceutical advantage in combining such substances. When competent medical men desire new combinations of remedial agents, it becomes the duty of the Pharmaceutist to apply his chemical knowledge in the preparation of them; but when supply precedes demand monopoly is too often fostered, and the *materia medica* overloaded. However important the discovery of new medicinal bodies may be, I think it undesirable to be constantly "ringing the changes" on those already well-known.

I beg to thank Mr. G. F. Wilson, F.R.S., Managing Director of Price's Candle Company, for the oleic acid used in the experiments. It is of a light yellow colour, and slight but pleasant odour. It contains a small quantity of solid acid, but this is not objectionable; indeed, for such a commercial article it is remarkably pure.

The Chairman thought Dr. Attfield's process seemed likely to be a convenient and good one for preparing "cod-liver oil with quinine," and other similar preparations for which it could hardly be said that good processes had hitherto been given.

Mr. Deane, while he thought the process given was an improvement upon those hitherto adopted, was glad to find that Dr. Attfield did not propose by the application of his process to extend the class of preparations referred to. He (Mr. Deane) considered the practice of unduly multiplying the forms of preparation of different medicines was one that ought to be discouraged. It had become too much the fashion for chemists to exercise their ingenuity in introducing new combinations of medicinal substances, instead of improving those already in use; and the consequence of thus "ringing the changes" was that they were constantly annoyed by having new and previously unheard-of preparations ordered, which they had much trouble in procuring, and which only served to fill their shelves with worthless lumber. The greater part of these new preparations were only intended as means of advertising those who introduced them, and had nothing intrinsically good to recommend them in preference to well-established medicines.

Dr. Redwood quite agreed with the last speaker that it was not desirable to multiply unduly the number of medicines in use, but that they should endeavour to improve those already known; yet while medical men ordered such compounds as "cod-liver oil with quinine" pharmaceutists must make them in the best way they could. He agreed with the Chairman that Dr. Attfield's process promised to be an improvement upon processes previously known, but he thought the preparation was essentially a bad one in whatever way it was made. All the specimens of "cod-liver oil with quinine" that were exhibited at the International Exhibition were so changed before the Exhibition was closed that they were unfit for use, and this change always occurred, however carefully the preparation was made. He considered in this preparation that two good medicines were spoiled by being mixed together. Both ingredients underwent rapid deterioration when mixed, which they did not do, at any rate to the same extent, when kept separately. He should be glad to know whether the change referred to took place equally when the combination was made as recommended by Dr. Attfield.

Mr. Daniel Hanbury sympathized with Mr. Deane in the remarks he had made on the introduction of new medicines. He also concurred with the last speaker in thinking that by combining cod-liver oil with quinine two good medicines were spoiled. This remark he thought was also especially applicable to the preparation called "cod-liver oil with iodide of iron." What possible advantage there could be in trying to keep these two medicines in combination, instead of mixing them at the moment of administration, he could not understand. The oily compound was a bad, decomposing, unsightly and nauseous preparation, whereas if it were thought desirable to administer iodide of iron with cod-liver oil, the former could be kept without change in the state of syrup, and this could be added to the oil when taken.

ON OXIDE OF COPPER.

BY EDWARD C. C. STANFORD, F.C.S.,

Demonstrator in the Laboratory of the Pharmaceutical Society.

The object of the experiments detailed in this paper was to furnish a good laboratory-method of making black oxide of copper. This reagent, so largely employed in organic analysis, is generally obtained by exposing to a red-heat the hydrated oxide, carbonate, or nitrate of copper. Of these, the latter salt is practically the only one now employed. The oxide from this source suggests a suspicion that all traces of nitrogen have not been entirely removed; it may be urged also, that a process which commences by oxidizing the metal, and combining it with nitric acid, and then driving the acid off, involves a large expenditure of a valuable oxidizing reagent, and is unsound in principle. It is true that by mixing the dry nitrate with a further portion of metal in filings, and calcining the mixture, the acid may be made to go further. Or the solution of the nitrate may be divided into two portions, and ammonia added to one till the precipitate redissolves, and the two solutions mixed together; a basic salt is thus deposited, which, by long boiling, is converted into the black oxide. This, according to my experience, is a most troublesome process, and the same objections to the oxide obtained from the nitrate by simple calcination apply also to this preparation.

An oxide produced by heating the metal in a current of air is now made on the large scale by Messrs. Tennant and Co., of Manchester. This contains on an average about 30 per cent. of metallic copper, the remainder being a mixture of suboxide and protoxide, which, when dissolved in hydrochloric acid, yields dichloride of copper. Several attempts have been made to

imitate this in the laboratory by heating strips of copper-foil strongly in a muffle: we have obtained by twelve hours' exposure to a bright red-heat an oxide containing about 40 per cent. of metallic copper, but have been unable to carry the oxidation further. Tennant's oxide is available for use in organic analysis; but as it is not a pure protoxide, it cannot be considered a good model for imitation.

Turning from the metal to its salts commonly occurring in commerce.—

The diacetate was found to yield a partially reduced oxide; it is very dense, and suitable for combustion, but the source is too expensive.

Brunswick green, described as an oxychloride, was next tried, but the only sample I could meet with contained no copper, and but a mere trace of iron; it left a large earthy residue on calcination, insoluble in acids.

Blue verditer, as the commercial carbonate ($2\,CuO,CO_2,HO$), was next employed; this yields a remarkably good oxide, but there are two kinds met with in commerce, one sold retail at 1*s.* per lb., and the best variety at 2*s.*; the former contains sulphate of baryta, the latter is pure, with scarcely a trace of lime: sulphate of baryta would not interfere with its use in combustion. Blue verditer affords, by simple heating, the most ready source of oxide of copper.

The sulphate is, however, undoubtedly the salt from which we ought to be able to obtain our supply of black oxide; it is at once the cheapest and most available.

By simply heating sulphate of copper, a large portion of the sulphuric acid may be driven off at a red-heat; but the last traces cling obstinately to the oxide, and require for their complete removal a temperature at which it commences to soften. But here another difficulty arises: no crucible that I have met with will resist the solvent action of the oxide at this temperature; Hessian and Cornish crucibles are speedily destroyed, and the best cast-iron melts readily before it. When a good hammered iron crucible was employed, an apparently fine dense oxide was obtained, which, upon examination, proved to be entirely protoxide of iron, the whole of the copper being found in the metallic state at the bottom of the crucible.

I picked out some good specimens of oxide from the Hessian crucibles; they were remarkably dense and crystalline, but contained a small portion insoluble in acids, which proved to be silicate of copper.

Failing then to find a crucible in which the oxide could be partially melted with impunity, I was induced to try some means of splitting up the sulphuric acid into sulphurous acid and oxygen, hoping thus more easily to drive off the acid, and produce the oxide at a lower temperature. To effect this, reducing agents were mixed with the sulphate. Sulphur was first selected, in proportions to obtain the following decomposition:—

$$2\,(CuO\,SO_3)+S=2\,CuO+3\,SO_2.$$

The sulphur however burnt off first, and the same difficulty in getting off the last traces of sulphurous acid was still experienced.

Coke was then tried, in the following proportions:—

$$CuO\,SO_3+C=CuO+CO+SO_2.$$

There was no improvement, and the metal was partly reduced.

The proportion of carbon was reduced to the following:—

$$2\,(CuO\,SO_3)+C=2\,CuO+2\,SO_2+CO_2.$$

Charcoal and coal were both tried, but with no better results.

Oxalic acid was also employed in the following proportion, but without material effect:—

$$CuO\,SO_3+C_2\,O_3\,3\,HO=CuO+SO_2+2\,CO_2+3\,HO.$$

I had anticipated here that the large proportion of carbonic acid would assist in driving off the sulphurous acid.

The ammonio-sulphate of copper, and mixtures of the sulphate with carbonate of ammonia and chloride of ammonium, were found no better than the simple sulphate.

I was more successful with a mixture of the diacetate with the sulphate. The best proportion is one part of the former to three parts of the latter salt; the sulphate is employed dry, and mixed with the ordinary diacetate; when exposed to a red-heat in a covered crucible the mixture aggregates into lumps, which must be removed, powdered, and reheated in an open crucible. The oxide thus prepared is pure, very dense, and crystalline.

The best method however of making black oxide of copper is to fuse a mixture of dry sulphate of copper with dry carbonate of soda in equivalent proportions; taking about four parts by weight of the sulphate, and three parts of the carbonate. When all effervescence has ceased, the fused mass is poured into water, the black oxide strained off, and well washed. Carbonate of potash answers the same purpose; but I prefer carbonate of soda, as the resulting salt is more easily washed out.

It is not necessary to dry the two salts separately; in fact, I prefer to heat the crystals together in an evaporating dish; they both liquefy in the water of crystallization, and if the heat be continued, nearly the whole of the carbonate of copper at first formed is soon reduced to black oxide; it must however be heated to redness in a crucible, to decompose any trace of carbonate remaining. This may be done before or after washing; if after, then the liquid mass as soon as it becomes black is poured into water, and the precipitate collected and washed; but if heated before washing it is merely dried up, and the resulting black mass fused in a crucible as I have indicated. The equivalent quantities of the crystallized salts represent about two parts of the sulphate to three of the carbonate. Great excess of carbonate of soda should be avoided, as prolonged fusion with oxide of copper expels the carbonic acid, and leaves a green compound, which is probably cuprate of soda.

While on the subject of oxide of copper, I would call attention to a fact which was first noticed by Mr. Braithwaite, but which has never been published. In all manuals on chemistry, without, I believe, any exception, chloride of copper is spoken of as highly deliquescent: this is an error. When chloride of copper is green it contains uncombined water, and when exposed to a humid atmosphere will absorb more; but when blue, it is free from moisture, and has no tendency to deliquesce. I made an analysis of this beautiful salt some years ago, the results of which are appended:—

	Graham.	Stanford.	Theory.
Copper	78·47	37·60	37·47
Chlorine		40·93	41·45
Water	21·53	21·47	21·08
	100·00	100·00	100·00

These blue crystals therefore have the formula Cu Cl+2 HO, assigned by Graham and others to chloride of copper. When dried over a water-bath they become brown, and lose the water of crystallization; regaining however their blue colour and precise original weight after three or four hours' exposure to the air.

Dr. W. S. Squire inquired whether, in the process which Mr. Stanford seemed to recommend as the best of those described by him, in which sulphate of copper was fused with carbonate of soda, the whole of the alkali

could be easily removed by washing, as, if any portion were left, it would interfere with the results in some organic analyses.

Mr. Stanford said the oxide produced was so dense that there was no difficulty in washing out the soluble salts.

MAGNETIC PEROXIDE OF IRON.

Mr. C. H. Wood said, he wished simply to point out that quite recently a communication had been made to the French Academy, by a distinguished chemist, upon a subject which was some years ago introduced and discussed at a meeting of the Chemical Discussion Association, the results being afterwards published in a short note in the 'Pharmaceutical Journal,' and also in the 'Chemical News.' On June 6th, 1859, Mr. J. Robbins read a paper before the Chemical Discussion Association, the object of which was, to show that perfectly pure and definite Peroxide of Iron might exist in a state in which it was strongly attracted by the magnet. He showed that when ordinary black magnetic oxide of iron is heated up to a certain point, it glows, and apparently enters into combustion; upon cooling, it presents the red colour and general appearance of sesquioxide of iron, but is still strongly attracted by the magnet. By dissolving it in hydrochloric acid, adding acetate of potash, and then ferridcyanide of potassium, no evidence of the presence of any protoxide can be obtained. The subject excited a great deal of discussion; several of the members were inclined to doubt the truth of the conclusion, and to suspect the existence of some latent error in the experiments. Some little investigation was afterwards made by others, with a view of solving the problem, and the matter was again brought forward at a subsequent meeting. It was then shown that the increase of weight sustained by the black oxide was exactly consistent with its perfect conversion into peroxide; that moreover the magnetic peroxide gained nothing by solution in aqua regia and again precipitating. It was also shown that if the black oxide be fused with nitrate of potash, nitrate of ammonia, or chlorate of potash, the magnetic properties of the oxide were retained unimpaired, although the oxidation was necessarily completed.

In the 'Comptes-Rendus' for the 25th of August, 1862, a paper appeared, by M. Malaguti, on "Sesquioxide of Iron attractable by the Magnet." In this communication, the author directs attention to the existence of amorphous hydrates of peroxide of iron and of salts of iron, which furnish, by a gentle calcination, a very magnetic peroxide of iron. He states that whenever carbonate or an organic salt of protoxide of iron is sufficiently heated in the air to completely eliminate the acid, the very pure peroxide of iron which results is always very magnetic. The protoxide which has been precipitated by ammonia and afterwards exposed to the air, by which it fixes some ammonia, when slightly roasted, furnishes magnetic peroxide. Ordinary rust, also, which has been freed from all magnetic particles by a magnet, when calcined is itself powerfully attracted. The author remarks that these magnetic peroxides yield no evidence of protoxide to the most delicate reagents, and moreover retain their magnetism after deflagration with chlorate of potash. If maintained for a long time at a very high temperature, however, or if dissolved in an acid, the magnetism is destroyed. M. Malaguti also considers the conditions under which non-magnetic peroxide of iron can be obtained. He states that when a persalt of iron is precipitated by an alkali, or when a salt of protoxide with a mineral acid is peroxidized, the resulting oxide is not magnetic, and suggests some theoretical considerations from these facts.

Subsequently, in consequence of some doubts expressed by M. De Luca, a

commission was appointed for the purpose of examining these results, and M. Malaguti sent, for their investigation, a number of compounds capable of furnishing by calcination magnetic peroxide of iron. These were as follows:—

1. Oxalate of protoxide of iron.
2. Subacetate of peroxide of iron, resulting from the peroxidation in the air of proto-acetate.
3. Bicarbonate of protoxide, partly peroxidized by air.
4. Ordinary rust, purified by means of a powerful magnet.
5. Hydrated protoxide of iron, peroxidized by air.
6. Ferroso-ferric oxide.

With reference to the last specimen, M. Malaguti observes: "In my opinion, this substance represents the most certain and the least disputable source of magnetic peroxide. It is only necessary, in fact, to deflagrate it with chlorate of potash to obtain pure sesquioxide of iron, and almost as magnetic as the compound from which it is derived."

It will be seen from what has been stated that Mr. Robbins had anticipated M. Malaguti in some of his experiments, and had established the existence of magnetic peroxide of iron, but that the latter has more fully investigated the subject.

The Chairman said it would be satisfactory to the meeting, and must be especially so to Mr. Robbins, to have had this subject brought under their notice, and the claim of their member for priority of discovery thus made public. He hoped the circumstances connected with it would stimulate Mr. Robbins for further exertions.

Dr. Redwood said, as Mr. Robbins was present, he would perhaps inform the meeting if he had made any further experiments on the subject since those he had published.

Mr. Robbins said his experiments were made three or four years ago, and having satisfied himself of the result, he had not pursued the investigation further.

Mr. Daniel Hanbury hoped that, in addition to the claim made here on behalf of Mr. Robbins for priority of discovery, a communication would be sent to the same effect to the Academy of Sciences at Paris.

Dr. Redwood thought, as Mr. Wood, the Secretary of the Chemical Discussion Association, had very properly put in a claim, on behalf of a member of that Association, for the credit of having discovered a fact in chemistry which had recently excited some interest among scientific men, that he (Dr. Redwood) might be allowed to avail himself of the opportunity of urging a claim, not on behalf of an individual, but of an Association, the Chemical Discussion Association, to which reference had just been made. The claim he made was, for the credit due to this Association for having, on this and several other occasions, provided matter which he hoped had proved interesting and instructive to the members at their Pharmaceutical Meetings. On the present occasion it so happened that the whole of the papers which had been read to them emanated from the Chemical Discussion Association, which, as many present were no doubt aware, consisted of some of the younger members and associates of the Pharmaceutical Society, who met in one of the rooms of the Society once a month, for the purpose of promoting the investigation of questions in Chemistry and Pharmacy. This little Association had been working in a quiet and unostentatious manner for several years, furnishing matter from time to time for the Pharmaceutical Meetings and Journals, but very rarely appearing in any other way before the public. As some doubts were expressed when this Association was formed, as to the benefits likely to result from it, he (Dr. Redwood) thought he might now, after several years' experience, refer with congratulations to the result, and appeal on behalf of this

Association for a larger share of encouragement and support from the members of the Society.

Mr. Deane was very glad to hear the statement that had just been made. When the Chemical Discussion Association was formed some years ago, he was one of its advocates, and it was gratifying to him to find that the anticipations which he and others had formed had been so far realized, while the objections which had been urged against its formation were proved to be groundless.

Mr. Hills was also much pleased to hear that the Association referred to was progressing so favourably. He should at all times be anxious to promote its advancement.

POWDERED AROMATIC CONFECTION.

Mr. Curtis requested the permission of the Chairman to make some remarks on a communication which appeared in the last number of the 'Pharmaceutical Journal,' in which Mr. Giles, of Clifton, at page 371, threw out what he thought was an unwarrantable imputation upon wholesale houses, who were accused of resorting to sophistication for the development of a fine yellow colour in the powdered aromatic confection. He (Mr. Curtis) had placed upon the table a bottle of the powder in question, and he defied any one to prove that it contained any other than the ingredients ordered in the Pharmacopœia. If improved methods were discovered for combining the ingredients by which the colour was rendered agreeable instead of being disagreeable, he thought it was too much to designate this a sophistication. He greatly objected to wholesale imputations, such as he had alluded to, being admitted into the Journal of the Society.

Mr. Whipple had been very glad to see the remark alluded to in Mr. Giles's letter, being satisfied, as a practical man who had had no small experience in such preparations, that the bright yellow colour of the powder on the table could not be produced if the instructions of the Pharmacopœia were strictly followed. He did not say the colour was due to adulteration, but was it not produced by a deviation from the Pharmacopœia instructions?

Mr. Curtis said the colour was due to the saffron, and if by manipulation this was brought into a state in which the colour was fully developed and equally diffused through the mass, he did not think any objection could be justly taken to such a mode of preparing it.

The Chairman had been informed that the fine yellow colour was produced by very complete comminution. If that were so, it was certainly not a case of adulteration; but still it might be a question whether the College of Physicians intended such a comminution to be adopted as would be only attainable by those who had the command of a powerful drug-mill.

Dr. Redwood thought before the meeting concurred in the objection which had been taken to the statement made by Mr. Giles in his letter, they should be satisfied that such statement was really made. Now he found, on referring to the letter, that Mr. Giles states, with reference to the bright yellow colour of the powder in question, that it "does not belong to it when made in unsophisticated submission to the Pharmacopœia directions." This was not saying that it was adulterated, but that the instructions of the Pharmacopœia were not implicitly followed. He wished to ask Mr. Curtis whether nothing was done to the saffron in order to develope the colour, besides submitting it to very complete comminution?

Mr. Curtis said he did not prepare it at home, but he had no doubt his instructions were attended to at the drug-mill at which it was made. He declined to explain what the process was by which it was produced, but would be willing to give the process if it could be introduced into the Pharmacopœia.

The CHAIRMAN thought the statements just made put a new feature upon the question. It appeared that Mr. Curtis did not make the preparation himself, but was dependent upon a drug-grinder for its production; and that the process was not only different from that of the Pharmacopœia, but was a secret process. Under these circumstances, he did not think it worth while to prolong the discussion.

Mr. DEANE wished to offer a few remarks before the subject was dismissed. Many pharmaceutists had not the means of making, and therefore were unable to make all their own preparations; they were dependent on wholesale houses for supplying them, and he thought they should be very careful how they brought the charge of sophistication against such houses. Before bringing any such charge they should be well satisfied that there were good grounds for it. A mere difference in appearance was not sufficient to justify such a charge. They all knew that such differences frequently occurred, although the instructions of the Pharmacopœia were correctly followed. He hoped, while they were careful as far as possible to ensure the integrity of their preparations, that they would be charitable towards those upon whom they were dependent for the supply of them.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eighth Meeting of the Session was held at the Royal Institution, Colquitt Street, on Thursday evening, January 29th; the President, JOHN SHAW, Esq., in the chair.

The following donations to the library were announced:—The 'Pharmaceutical Journal,' for January, from the Society; and two volumes of 'Lectures on the Elements of Chemistry,' by Dr. Joseph Black, date 1803, from Mr. Long.

The President exhibited to the meeting a specimen of a new ink-eraser, which was said to be most successful in removing ink-marks from paper.

The paper of the evening, "On Granite," by Mr. Nathan Mercer, F.C.S., was, in the unavoidable absence of the author, read by the Honorary Secretary, Mr. N. Tate. The paper was illustrated by diagrams and numerous specimens, and Mr. G. H. Morton, F.G.S., explained some facts relating to the subject. At the conclusion of the paper, a discussion ensued, in which Dr. Edwards, Mr. Martin Murphy, Mr. Morton, Mr. H. Bird, and other members took part.

A vote of thanks to Mr. Mercer, for his paper, and to the donors to the library, was passed, and the proceedings terminated.

The Ninth Meeting of the Session was held at the Royal Institution, February 12th; the President in the chair.

Mr. Evan Williams was elected a member.

The donations to the library included the following:—'Technologist,' for February, from the editor; the 'Statistical Register of Victoria,' the 'Victorian Government Prize Essays,' 1860, 'Catalogue of the Victorian Exhibition, 1861,' 'Statistical Notes of the Progress of Victoria,' all presented by the Commissioners of Victoria, Australia. The donations to the museum comprised,—Series of products from Victoria, exhibited in the International Exhibition, and presented by the Victoria Commissioners. Mr. H. S. Evans exhibited and presented to the museum some minerals from New Brunswick.

Mr. Nathan Mercer exhibited a model of an ingot of platinum, melted by the process of Messrs. H. St. Claire Deville and H. Debray. The weight of the ingot was 2300 ounces, and its value £3840. Mr. Mercer presented the model to the museum of the Association.

Dr. Edwards exhibited some very beautiful experiments on Magnetic Light and Electric Discharges *in vacuo*, and gave a short lecture concerning them, in which he

particularly pointed out their applicability to the purpose of signalling on railways, etc.

The new instrument invented by Professor Hughes, of Kentucky, for transmitting and printing telegraphic messages, was shown, and worked during the evening by Mr. Andrews. This instrument is now in use on the lines of the United Kingdom Telegraph Company.

Votes of thanks were passed to the donors to the library and museum; to Dr. Edwards, for his lecture; and to Professor Hughes, the manager of the United Kingdom Telegraph Company, and to Mr. Andrews, for their kindness in exhibiting the telegraphic instrument.

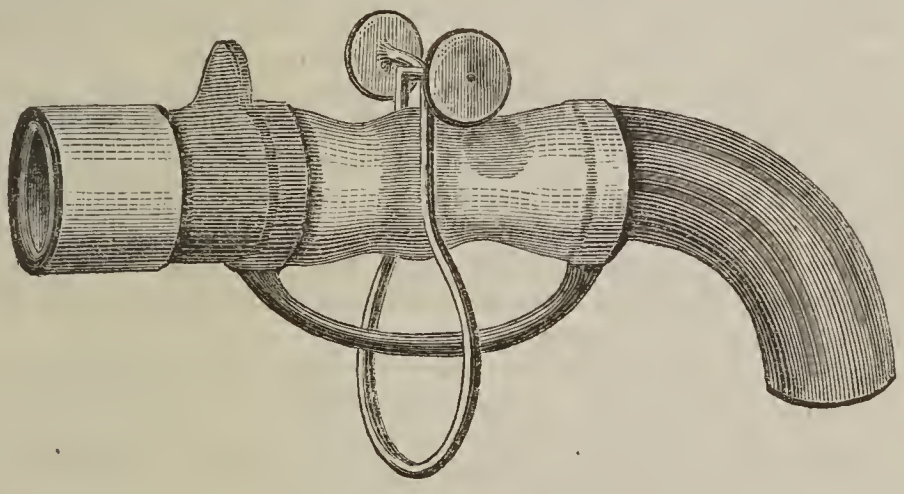
LEEDS CHEMISTS' ASSOCIATION.

The second ordinary meeting was held at the Town Hall on Monday evening, February 9th; the President, Mr. HARVEY, in the chair.

The Rules, Lists of Members and Associates, and President's Inaugural Address, were distributed in the form of a pamphlet. This is uniform in size with the 'Pharmaceutical Journal,' for convenience of binding with it,—a hint which may be suggestive to other kindred Societies. The Lists of Original Members and Associates had each enrolled fifty names before going to press, and additions to each had since occurred.

Mr. FELIX M. RIMMINGTON, of Bradford, was elected a Corresponding Member.

Mr. R. REYNOLDS exhibited a gutta-percha tap, which he proposed as a substitute for metallic ones in some cases, more especially for use in the wickered-glass store-bottles now so commonly employed. The compression-spring of Mohr's Alkalimeter



is applied to a tap made of two pieces of gutta-percha joined by soft vulcanized india-rubber. As the spring closes as soon as the fingers are removed, the tap cannot be left running. Its cheapness was offered as a merit, the cost of material, independently of the spring, being only two or three pence. The springs would be equally cheap when a demand arose.

Other means of compression could be employed, as a screw, which would liberate the fingers of the person using the tap. Without expecting any very important results from the present suggestion, Mr. Reynolds believed that we had kept too closely to one principle, that of the spigot, for all kinds of taps, and that the manifest faults of those taps for alcohol charged with resinous or other matters, as in tinctures, pointed to the compression principle as deserving of notice. The vulcanite or ebonite taps were alluded to, but are somewhat costly at present.

Mr. GEORGE WARD read a paper upon "The Petroleum Oils of America." He alluded to the numerous instances of bituminous oils and naphthas found in various parts of the globe, and described the conditions, geological and otherwise, under which the oil-springs of Canada and the United States are situated.

The most probable explanations of their origin were alluded to, but it was shown that we were too doubtful of the origin of coal yet to determine the exact source of these allied products.

The fact that petroleum oil gives off, at temperatures varying from 60° Fahr. upwards, inflammable vapours, is undeniable; consequently, an Act of Parliament was passed last session to regulate its storage, and not more than forty gallons of petroleum may be stored within fifty yards of any warehouse or dwelling.

The crude petroleum oil is only a raw material, and its distillation is effected in order to obtain various useful products. The first portion of the distillate (about one-third) is the most inflammable, and this, after redistillation, forms "turpentine substitute" for the use of painters; so volatile are some portions, that an icicle often hangs from the condenser from its rapid evaporation. The next portion, a third again, is fitted for use as an oil for burning, under the name of photogen, or paraffin oil.

Mr. Young denies the right to this last name, as he originally gave it to his trade-product from the distillation of coal.

An oil so prepared does not give off inflammable vapour under 100° or 110° Fahr., and will not ignite by the application of a lighted match, nor burn without a wick, which is the true test of safety.

The accidents which have occurred have been due to the distillers having left in the paraffin oil an undue proportion of the lighter and more volatile fluid. The state of the markets for these two products respectively will always govern the question of risk on this point. If "turpentine substitute" be slow of sale, it will be left in the paraffin oil as far as possible.

The residue in the retorts is a tarry matter, "dead oil," used as a lubricant, and for the extraction of solid paraffin. The lighter oil is sometimes termed "benzine spirit," a misnomer to be guarded against. It does not contain any benzine, and consequently will not yield aniline or its derived dyeing principles.*

The Canadian oil contains sulphur compounds, which depreciate its value for mixing paint. In the first nine months of 1862, our imports from the United States and Canada were 200,000 barrels, value £600,000. The price of Canadian oil rose from £8 per ton in May, to £20 in October of the same year.

(The report of Dr. Edwards's paper on the same subject, in the 'Pharmaceutical Journal' for December last, limits the necessity for enlarging this *résumé*.)

In the course of a discussion, some members asked for information as to any use made of paraffin for adulterating spermaceti. It was also suggested that its applicability as a vehicle for ointments should be tested.

Mr. R. Reynolds introduced the subject of "A New Test for Wood-Spirit," by giving an account of the paper read before the Royal Dublin Society by Mr. Emerson J. Reynolds. ('Chemical News,' January 31.)

The author alludes to Ure's test for the admixture of wood-spirit with alcohol. This consists in the fact that powdered hydrate of potash added to alcohol containing wood-spirit causes it to become brown within half an hour. He then takes exception to this test, because the distillate of a pure alcoholic tincture would give the same reaction by virtue of volatile oils present.

Mr. R. Reynolds showed that to the practical pharmaceutist there was a more serious defect than this, because the spirit which he wished to test nearly always consisted of stronger or weaker forms of sweet spirit of nitre, in consequence of the methods now adopted for "cleaning."

Now, *pure* spirit of nitre gave a most decided brown colour with the potash test, and of course its use for all compounds containing it was illusory. Dr. Redwood informed him that aldehyd was the cause of this reaction.

The new mercurial test was then exhibited. Since the author had not given any proportions in the report of his process, experiment had led Mr. Reynolds to adopt the following:—

A saturated solution of chloride of mercury (corrosive sublimate) was diluted with three times its bulk of water, and reserved as the test-liquor. The liquor potassæ was free from carbonate.

Into a wide test-tube two fluid drachms of the alcohol were put, and the mercurial

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* The prospectus of the "Canadian Native Oil Company," inserted in a pamphlet, 'The Canadian Native Oil' (Ashby and Co., 79, King William Street, E.C.), reckons these dyes as one source of prospective profit!

solution in quantity of five minims, or any amount up to twenty minims ; but in any comparative trials the same amount was carefully adopted in all cases. The mixture was warmed, then the potash added in moderate excess.

The distinction between the reaction of pure spirit giving a bright orange precipitate of oxide of mercury, and that of methylated spirit, which gave no deposit but a trifling white one, is clear enough.

The author of the test goes further in exhibiting the varied reactions produced by boiling, and by the addition of acetic acid ; but it appears better to clear up the first difference in behaviour before following up these other developments.

Now Mr. R. Reynolds found that in the case of sweet spirit of nitre of various strengths, the reactions of the mercurial test were as completely upset as were those of Ure's test under the same conditions. He showed that pure spirit of nitre acted like the methylated in yielding no precipitate of oxide of mercury. Further, the influence which had been pointed to as destroying the value of the potash test, viz. the presence of volatile oils, had the same nullifying action here. The distillate of pure Tinctura Rhei, and that from the same tincture made with "cleaned" sweet spirit of nitre, gave identical results, and both would have been condemned.

Half a drop of an essential oil of turpentine or lemon (to represent the hydrocarbons) or lavender or cajeput (oxygenated oils), entirely destroys the action of the test. Fusel oil does the same. The fluid obtained as a product in these cases exhibits a light white precipitate, but is totally distinct from the product when pure spirit is used.

It appeared that the promising anticipations raised by the trial of the test upon unmixed substances could not be sustained, and since this test had already been made the basis for statements that the officinal tinctures sold in Dublin were largely adulterated, it became especially needful to subject the process itself to severe scrutiny.

The issue of the author's own version of the subject is highly desirable, and may throw additional light upon it.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., ETC.

(*Continued from p.* 357.)

IX. XANTHOXYLON FRAXINEUM, *WILLD.*—PRICKLY ASH, TOOTHACHE SHRUB.

History.—The bark of this shrub has been employed in domestic practice in the States of North America as long as we have any authentic records. The author of 'Positive Medical Agents'* says, "As a domestic medicine it is much used throughout the country, especially by the negroes, who make a kind of bitters with it, which they drink at the spring of the year. In domestic practice, it is used, either in tincture or decoction, as a 'purifier of the blood.' We had our attention first called to its virtues by seeing it used in domestic practice. It was introduced to the profession as early as 1788, but was not used to any extent, we believe, until about 1820 ; since when it has gradually gained favour, and is now regarded as a reliable agent by all classes of practitioners."

It has long been officinal in the United States Pharmacopœia, where it is included in the Secondary List of the Materia Medica. It is chiefly valued in North America as a remedy in chronic rheumatism, in which dis-

* 'Positive Medical Agents,' page 202.

ease it is reputed to be highly serviceable. In its general action it is commonly regarded as resembling mezereon and guaiacum. The bark of the Prickly Ash, and the resinoid obtained from it, termed *Xanthoxylin*, which is employed by the Eclectic practitioners, have been recently imported into this country, and introduced to the notice of the regular medical practitioners;* and as we have but very few articles of the Materia Medica which possess altogether their reputed remedial virtues, they are well worthy of, and it is very desirable that they should undergo, an extended trial, with a view of testing those properties that have been ascribed to them, both by the qualified medical practitioners and by the Eclectics in North America.

Synonyms.—There is much confusion in some botanical works as to the names of this plant, which renders it of importance that we should carefully allude to its synonyms. It is the *Xanthoxylon fraxineum*, Willd., vol. iv. p. 757, and of Lindl., Fl. Med. p. 216; the *Xanthoxylum fraxineum*, Smith in Rees's Cyclop., Bigelow's Med. Bot. vol. iii. p. 156. t. 59, and De Cand. Prod. vol. i. p. 726; the *Xanthoxylum ramiflorum*, Michx., Fl. ii. p. 235; the *Xanthoxylum tricarpum*, Hook. non Michx.; the *Xanthoxylon Clava-Herculis*, Duroi, and var. β, Linn. sp. 1455, and Lam. Dict. vol. ii. p. 38; the *Xanthoxylum americanum*, Mill. Dict., and Torrey and Gray; and the *Xanthoxylum caribæum*, Gærtn. non Lamarck. The original nomenclature of the genus, as given to it by Linnæus, was *Xanthoxylon*, but it is now more commonly spelt *Xanthoxylum*. Many botanists, as Gray,† spell *X*anthoxylum, *Z*anthoxylum. We use here the term Xanthoxylon to indicate the genus, as being the original form employed by Linnæus. In common language this species has been termed, Prickly Ash, Toothache Shrub, Prickly Yellow Wood, etc.

Etymology.—The generic name *Xanthoxylum* is derived from *ξανθός*, yellow, and *ξύλον*, wood, in allusion to the yellow colour of the wood of the species of this genus. The specific term *fraxineum* is derived from *Fraxinus*, the generic term of the genus of which our common Ash-tree is taken as the type, from the resemblance its leaves bear to that plant. The common terms Prickly Ash and Prickly Yellow Wood are derived from the prickly nature of the plant, combined with other leading characteristics. It is known as the Toothache Shrub, from the bark being a popular remedy as a masticatory in toothache.

Botany.—The genus *Xanthoxylon* was placed by Jussieu in the Natural Order Terebinthaceæ, and by Adrien de Jussieu in the Xanthoxyleæ, Suborder Rutacearum. By Nees and Martius, and by Endlicher, it was also included in the Order Xanthoxyleæ. By Kunth, it was comprised in the Pteleaceæ. In Torrey and Gray's 'Flora of North America,' we find the genus in the Zanthoxylaceæ; and in De Candolle's 'Prodromus,' in the Rutaceæ. Lindley and Wight include it in the Xanthoxylaceæ, in which Natural Order, following them, we have placed it in our 'Manual of Botany,'‡ to which we refer our readers for its diagnostic characters.

Generic Character.—*Flowers* perfect, or by abortion dicœcious or monœcious. *Calyx* usually 4–5-partite, rarely 3-partite, or the sepals are distinct. *Corolla* of as many petals as sepals, or absent. *Barren flower:*—*Stamens* equal in number to the petals and alternate with them, inserted round the base of the gynophore; *pistil* rudimentary. *Fertile flower:*—*Stamens* absent or rudimentary. *Carpels* 1–5, corresponding in number to the petals

* 'Lancet,' January 31, 1863, p. 128.
† Gray's 'Genera of the Plants of the United States,' vol. ii. p. 147.
‡ Bentley's 'Manual of Botany,' page 502.

or fewer, placed on the summit of a globose or cylindrical gynophore :* *ovules* 2 in each carpel, collateral, suspended : *styles* as many as the carpels, distinct or more or less united at the apex.† *Fruit* of 1–5 dehiscent carpels, 2-valved *Seeds* 1–2, black and shining.‡ *Trees* or *shrubs* usually with prickles on their branches. *Leaves* pinnate, with pellucid dots.§

Specific Character.—*Shrub* from about 5–10 feet high, the branches of which are armed with short strong sharp stipular prickles. *Leaves* unequally pinnate, the common petiole prickly on the back or unarmed; *leaflets*, of which there are generally 4–5 pairs with an odd terminal one, nearly sessile, ovate, acute, generally with obscure vesicular serratures, and somewhat pubescent on their lower surface.‖ *Flowers* polygamous, small, greenish, appearing before the leaves in sessile umbels or rather fascicles, and arising from near the points of insertion of the young branches. *Hermaphrodite flowers :—Calyx* of 5 sepals, oblong, obtuse. *Petals* none. *Stamens* 5. *Carpels* 3 or 4. *Barren flowers :—Calyx* and *Stamens* as in the hermaphrodite flowers; *carpels* abortive. *Fertile flowers* on a separate plant, with a smaller and more compressed calyx; *petals* none; *carpels* about 5; *stigmas* obtuse. *Fruit* pedicellate oval, covered with excavated dots of a greenish-red colour. Each fruit 2-valved, 1-seeded. *Seed* oval, blackish.¶

Habitat.—The Prickly Ash is only indigenous in the States of North America, where it may be found growing in woods and moist shady places throughout the Northern, Middle, and Western States. Its flowers, which appear before the leaves, expand in April and May.

Collection, etc.—All parts of the plant possess aromatic and pungent properties to a more or less evident extent. The leaves and fruit possess more aroma than the bark, owing to the large quantity of volatile oil they contain. This oil is contained in the vesicles which cover the margin of the leaves and the surface of the fruit. The odour of these parts, according to Bigelow,** resembles that of oil of lemons. The bark has less aroma than the leaves and fruit, but more bitterness and acridity. Both the fruit and the bark have been employed in medicine; but the *bark only* is officinal in the United States Pharmacopœia, and is that part which is almost exclusively used by the regular and Eclectic practitioners of North America. From it alone the resinoid *xanthoxylin* is obtained, which has been recently introduced, as we have already noticed, into this country. Our future remarks therefore, unless otherwise stated, refer alone to it.

For medicinal use the bark should be collected in the autumn or early spring, and that obtained from the moderate-sized branches should be preferred. We have had no experience in the use of the fruits, but should suppose they would be most serviceable as remedial agents if gathered just before they were quite ripe.

General Characteristics.—Prickly Ash bark, as found in commerce, i in more or less quilled pieces. These quills are single, commonly more or less broken up, and varying in diameter, length, and thickness. In length, they average about three inches; but quills are often found which are not more

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* See figure 593, in Bentley's 'Manual of Botany,' p. 276.

† Bentley's 'Manual' as above, fig. 593. s.

‡ Gærtner, Fruct. i. t. 68.

§ Wight and Arnott's 'Illustrations of Indian Botany,' p. 165, t. 66; Lindley's 'Flora Medica,' p. 215; Torrey and Gray's 'Flora of North America,' vol. i. p. 214; and Gray's 'Genera of the Plants of the United States,' vol. ii. p. 147.

‖ For a figure of this plant, see Gray's 'Genera of the Plants of the United States,' vol. ii. p. 148, and plate 156.

¶ Lindley's 'Flora Medica,' p. 216, and Torrey and Gray as above, vol. i. p. 214.

** Bigelow's 'Medical Botany,' vol. iii. p. 156.

than one inch, or in some cases even less than this. In commercial specimens, as seen in this country, the quills rarely much exceed three inches in length, which is due probably to their brittleness. In diameter, they vary from about a line to nearly an inch, the average size being somewhat beneath half an inch. The bark is very light in weight, and rarely more than about one-sixteenth of an inch in thickness, commonly much thinner, and in the smaller quills almost as thin as paper.

The quills vary in colour and other characters externally, according to their diameter, the *smaller* being of a brownish hue, with whitish patches scattered irregularly over the surface. The external part of the bark (commonly distinguished by pharmacologists by the name of periderm or coat) is, in these quills, closely attached to the inner bark. These quills are nearly smooth, only presenting commonly, faint longitudinal and transverse elevations, and at times, little whitish, roundish, minute prominences. In some cases, we find in these small quills the remains of prickles, and still more rarely, one or more fully developed prickles adhering to their surface. When the periderm is removed by scraping or otherwise, the exposed surface of the bark is seen to be of a more or less yellowish-brown colour. Internally, these quills present a whitish or faint yellowish-white colour; a somewhat shining appearance; and are nearly smooth, as they are only marked by faint longitudinal striæ.

The *larger quills* are of dark greyish-brown or ash colour externally, diversified more or less by whitish patches, which in some cases almost entirely cover the surface and give to such quills a marked resemblance to cascarilla or common grey bark. The periderm is in these large quills always more or less removed so that the inner layers of bark become exposed to a corresponding degree, and present a brownish, yellowish-brown, or reddish-yellowish-brown colour; hence, in describing the larger quills of commerce as regards their colour externally, we should say that they were greyish-brown, mottled with whitish, dark brown, or reddish-yellow-brown patches. The periderm is much rougher than in the small quills, being marked by irregular longitudinal wavy wrinkles, and transverse cracks with elevated margins. Internally, they have a yellowish-white or yellowish-brown somewhat cinnamon colour, and present more or less evident wavy longitudinal elevations.

All sized quills are very brittle, and break with a close resinous-like fracture. They have scarcely any odour, except when first dried, when they are very slightly aromatic. When chewed, they have at first a very faint aromatic somewhat sweetish taste; this is soon followed by a slight pungency, bitterness, and a marked and permanent acridity.

Xanthoxylon or Prickly Ash bark, has some resemblance to Pomegranate Root bark. It is, however, readily distinguished from it by its commonly more quilled appearance, by the darker colour of its external surface, by the deeper and less yellow colour of its inner surface, and at once by the action of nitric acid, for while this has no evident effect when applied to a fresh fracture or the inner surface of pomegranate root bark, it communicates an evident bright reddish tinge when added to like parts of xanthoxylon bark.*

Composition and Chemical Characteristics.—This bark was analysed by Dr. Staples, of the United States, as far back as 1829.† Its constituents, according to him, are—*volatile oil*, a *greenish fixed oil*, *resin*, *gum* in small quantity, *colouring matter*, *fibrous substance*, and a peculiar crystallizable principle, which he termed *xanthoxyline*, but the properties of which he does

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* See page 404 of the present number.

† Staples on *Xanthoxylum fraxineum*, Amer. Journ. Pharm. vol. i. p. 163; and 'United States Dispensatory,' by Wood and Bache, 11th edit. p. 800.

not appear to have investigated,—at least he gives no account of it in his paper in the 'American Journal of Pharmacy.' This xanthoxyline has been commonly regarded as identical with a bitter crystalline principle, called *xanthopicrite*,* which was discovered by Chevallier and Pelletan in the bark of another species of *Xanthoxylon*,† the *Xanthoxylon Clava-Herculis*, Linn, sp. 1455, and of De Candolle, Prod. vol. i. p. 727. As there are at least three species of *Xanthoxylon* which have received the latter specific name, it is important to notice that the *Xanthoxylon Clava-Herculis*, Linn., is the *X. carolinianum* of Gærtner, and the *X. caribæum* of Lamarck, but not of Gærtner.‡ This latter species is common in the West Indies, but is not a native of the United States. Recently, Mr. Perrins has made the very interesting discovery of the identity of *xanthopicrite* with *berberine*,§ hence there can be, we imagine, little, if any doubt, that the supposed peculiar principle first noticed by Staples in the bark of *Xanthoxylon fraxineum*, and termed by him *xanthoxyline*, is in reality berberine, as the identity of *xanthopicrite* and *xanthoxyline*, as already stated above, has been commonly inferred. This is the first recorded instance of the discovery of berberine in the Order *Xanthoxylaceæ*, and adds a new source to those already noticed‖ for this alkaloid. In his paper, Mr. Perrins has also announced further,¶ the discovery of berberine in *Coptis Teeta*, a plant belonging to the Ranunculaceæ, and in three other substances derived from unknown species of plants.

An infusion of the bruised bark of *Xanthoxylon fraxineum*, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for twenty-four hours, had a faint golden-yellow, sherry-like colour; a peculiar, strong, rather unpleasant, and somewhat aromatic odour; and a faintly aromatic, bitterish, ultimately pungent, and acrid taste. It exhibited the following reactions:—*Blue litmus-paper* was reddened by it; *tincture of iodine* produced a darkening of the colour at first, but the infusion remained clear, and no precipitate was formed; *solution of persulphate of iron* caused a greenish-black coloration, but no precipitate; *solution of perchloride of iron* produced a deep greenish-black coloration, but no precipitate; *solution of acetate of lead* caused an abundant yellowish-brown, light precipitate; *solution of basic acetate of lead* rendered the infusion opalescent, and ultimately produced a moderately abundant yellowish-brown precipitate; *solution of nitrate of silver* caused a plentiful yellowish-brown precipitate; *solution of oxalate of ammonia* made the infusion slightly turbid, and after some time produced a light precipitate; *tincture of galls* caused a plentiful brownish precipitate; *solution of chloride of lime* produced at first a greenish-black coloration, which disappeared almost immediately, and the natural yellow colour of the infusion gradually disappeared, and ultimately a whitish precipitate was formed. No very evident effects were produced in the infusion by the application of either *the solutions of ferrocyanide of potassium, chromate of potash, nitrate of baryta, sulphate of copper, bichloride of platinum, chloride of calcium, sulphate of lime, sulphate of soda, protochloride of tin, potassio-tartrate of antimony, gelatine*, or *ammonia;* nor by the addition of either *nitric, sulphuric*, or *hydrochloric* acids.

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* Wood and Bache's 'United States Dispensatory,' 11th edit. p. 800; Amer. Journ. Pharm., vol. ii. new ser. pp. 196; and Parrish's Pract. Pharm., 2nd edit. p. 421.

† 'Sur le *Xanthoxylum des Caraibes, ou Clavalier des Antilles*,' par MM. Chevallier et Gabriel Pelletan; Journ. de Chimie Med., vol. ii. p. 314. 1826.

‡ Gærtner, De Fruct. et Sem., vol. i. p. 333, tab. 68, fig. 8; and Lamarck, Encycl. Dict. de Bot.

§ 'On Berberine—Contributions to its History and Revision of its Formula,' by J. Dyson Perrins, F.C.S., in Transactions of the Chemical Society, 1862.

‖ Pharm. Journ. vol. iv. 2nd ser. p. 14.

¶ Trans. Chem. Soc., 1862, as above.

No sensible effect was produced on the surface of the fresh fracture, nor upon the recently exposed surface of the inner bark, by the application to such parts of either *solution of ammonia*, or of *sulphuric* or *hydrochloric acids;* but when *nitric acid* was thus added, it produced an evident red coloration of the parts submitted to its action.

We have given the above reactions, as in all former cases, when treating of these "New American Remedies," for the purpose of assisting those ignorant of them in distinguishing them readily from all other substances with which they may be ignorantly or fraudulently mixed. We have found a few simple chemical tests of such a nature materially to assist in the discrimination of the different drugs, and thus to form a valuable addition to the diagnostic characters furnished by the physical characteristics of the same specimens. At the same time, they form a guide to the prescriber of their different preparations; and give a clue, to some extent, of their chemical composition.

Adulterations and Substitutions.—In the States of North America it is by no means uncommon to find mixed with the ordinary Prickly Ash bark, as described above, or substituted altogether for it, another bark, which differs from it in several particulars. The exact origin of this latter bark is by no means well ascertained, although its physical and chemical characteristics clearly indicate that it is derived from a species of Xanthoxylon. A specimen in the Pharmaceutical Society's Museum, received from Philadelphia, is marked Xanthoxylon Clava-Herculis (?); but the fact of this plant not being a native of the United States, but of the West Indies, renders this origin improbable. We have had, through the kindness of Mr. Daniel Hanbury, an opportunity of comparing the specimen of bark analysed by Mr. Perrins and noticed above, which is stated to be derived from *Xanthoxylon Clava-Herculis*, Linn., and it is clear that the two barks have not been derived from the same species. It is said to be obtained from the more southern States of North America, and hence Dr. Wood* suggests, that it is probably derived from the trunk of the same plant as that which yields the ordinary Prickly Ash bark, more developed by growing in a warmer climate.† It seems to me far more probable that it is derived from the species of Xanthoxylon which is found in some of the southern States of North America, and hence termed the Southern Prickly Ash, to distinguish it from the more northern species, the *Xanthoxylon fraxincum*. This Southern Prickly Ash is the *Xanthoxylon carolinianum* of Lamarck, but not of Gærtner; the *Xanthoxylon tricarpum* of Michaux, but not of Hooker; and the *Xanthoxylon fraxinifolium*, Walt.

This bark is readily distinguished from the ordinary xanthoxylon bark, by occurring in irregular broken pieces of various sizes, which are flat or but slightly quilled, and commonly much thicker than it; by being generally darker on its inner surface; and by its external surface having frequently attached to it very large corky laminated prickles. These prickles are also generally found in variable proportions, lying loosely scattered in the bark. In its properties it appears to be almost identical with the bark of *X. fraxineum*, but we should regard it as somewhat more bitter and acrid. Dr. Gray, also, and Dr. Griffiths,‡ in speaking of the bark of the *Xanthoxylon carolinianum* of Lamarck, also states that it is more acrid than that of *X. fraxincum*. We have minutely examined the reactions of an infusion of the bark, of the same strength, etc., as that mentioned above of the bark of *Xanthoxylon*

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* Wood and Bache's 'United States Dispensatory,' 11th edit. p. 800.

† Pharm. Journ. vol. xvi. p. 271.

‡ Griffiths, Med. Bot., p. 197; and Gray's 'Genera of the Plants of the United States,' vol. ii. p. 146.

fraxineum, and have found no very marked differences in the effects produced by the same reagents, except that the *solution of bichloride of platinum*, which had no evident effect upon the infusion of the latter, produced an abundant light yellowish-brown precipitate in that of the former.

Medicinal Properties and Uses.—Dr. Lee, in the 'American Journal of Materia Medica,' states "that the Prickly Ash is a very valuable stimulating, alterative tonic, and has been very justly compared to the mezereon in its physical and therapeutical properties. Though extensively used in domestic practice in chronic rheumatism, etc., it has not been so much employed in regular practice as it deserves; for it is unquestionably one of our most actively medicinal plants, as its sensible properties very plainly indicate. As a powerful and permanent stimulant in languid, torpid conditions, especially in patients of a lymphatic, phlegmatic temperament, it deserves high eulogium; proving equal, if not even superior, to guaiacum and mezereon. When first swallowed, it causes a sensation of heat in the stomach, followed by general arterial excitement, and a tendency to diaphoresis. Sometimes a pricking sensation is experienced throughout the body, extending to the limbs, very similar to that caused by strychnia. It seems to rouse the organic nervous agency in a marked degree, and in consequence promotes the circulation throughout the whole capillary system; and this effect is not transient, like that produced by the more diffusible stimulants, as alcohol and camphor."* Dr. Lee also speaks highly of its value in the treatment of syphilis, regarding it in this disease as more reliable and efficient than sarsaparilla, or most of the other vegetable alteratives in common use. It might probably be combined with good effect with sarsaparilla and guaiacum, either in the form of a compound decoction, or syrup. It is said to excite salivation in all cases, whether internally administered or applied locally. As it excites a more or less burning sensation when chewed, attended by a salivation, it has proved useful in toothache, and in some cases of paralysis of the tongue.† The powder and decoction have been also locally applied as irritants, it is said, with some success. Dr. Wood also says that Xanthoxylum is thought to resemble mezereon and guaiacum in its remedial action, and is given in the same complaints. As a remedy in chronic rheumatism, it enjoys considerable reputation in the States of North America.‡ A tincture of the fruit of *Xanthoxylon fraxineum* is said to have been used very extensively, and with wonderful results, during the cholera epidemic in some parts of North America, in 1849. A tincture of the bark, in the same cases, was stated to be less efficient.§

The properties as thus noticed, which are claimed for the Prickly Ash by American medical practitioners, are regarded by the Eclectic practitioners as possessed in an eminent degree by Xanthoxylin,‖ a kind of oleo-resinous, hydro-alcoholic extract, or resinoid, obtained from the bark. This appears to us to be a very indefinite preparation, and we should recommend in preference the decoction or the tincture of the bark. Dr. Grover Coe¶ regards *xanthoxylin* "as a remedy of great value in the atonic form of indigestion, scrofula, chronic rheumatism, paralysis, general debility, cutaneous eruptions, ulcers, chronic diarrhœa, dysentery, ulcerations of the stomach and bowels, syphilis, gleet, leucorrhœa, etc., and for the correction of all languid conditions of the system.

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* Lee on Indigenous Tonics in Amer. Journ. Mat. Med., vol. ii. p. 366, 1860.

† Amer. Journ. Pharm., new ser. vol. ii. p. 195.

‡ Wood and Bache's 'United States Dispensatory,' p. 801; and Wood's 'Therapeutics and Pharmacology,' vol. ii. p. 646.

§ 'Positive Medical Agents,' p. 204; and 'Lancet,' for January 31, 1863.

‖ Grover Coe's 'Concentrated Organic Medicines,' p. 380; 'Positive Medical Agents,' p. 204.

¶ 'Concentrated Organic Medicines,' p. 381.

It enhances the efficacy and gives permanency to the influences of other stimulants and tonics." This supposed active principle of *Xanthoxylon fraxineum* bark, Xanthoxylin, would now appear to be essentially composed of a mixture of berberine, oil, and resin. It has a bitterish, somewhat aromatic, and pungent taste, and the peculiar odour of the bark. If properly prepared according to a recognized formula, it might become a reliable preparation; but as now met with, it varies much in appearance, taste, odour, and medicinal properties. It should be particularly noticed that this *xanthoxylin* is a different substance to the *xanthoxyline* noticed before as obtained by Dr. Staples,* and which we have already seen would appear, from the analysis of the bark of an allied species of Xanthoxylon,† by Perrins, to be berberine.

Administration, Preparations, and Doses.—Prickly Ash bark has been given in powder, and in the form of infusion, decoction, tincture, extract, etc. The favourite remedy of the Eclectics, as alluded to previously, is a kind of oleo-resinous extract (*xanthoxylin*). An oil of Xanthoxylon is also in frequent use by the latter practitioners, which Dr. Coe states‡ "possesses properties analogous to xanthoxylin, being however more decidedly stimulating, with less of the alterative and tonic properties. Its use is more appropriate in asthenic than in sthenic conditions, as it is apt to produce too much irritation of the mucous surfaces. It is employed in colic, chronic rheumatism, syphilis, etc."

Although the bark of the Prickly Ash is officinal in the United States Pharmacopœia, it is only mentioned in the Secondary List of Materia Medica, and no formulæ are ordered. As the drug is very likely, we believe, to come into some demand in this country, we subjoin the following forms for some of the preparations, the two first of which have been obtained from American periodicals, and that of the tincture we are responsible for.

Infusion of Xanthoxylon.—Take of the bark of *Xanthoxylon fraxineum*, bruised, *one ounce and a quarter;* boiling water, *two pints*. Macerate for one hour in a covered vessel, and strain.

Decoction of Xanthoxylon.—Take of Xanthoxylon bark, bruised, *one ounce and a quarter;* boiling water, *three pints*. Boil down to a quart, and strain.

Tincture of Xanthoxylon.—Take of Xanthoxylon bark, bruised, *four ounces;* proof spirit, *two pints*. Digest for fourteen days, express, and filter. Or the tincture may be made in the ordinary way by percolation.

The following formula for a tincture of the fruit or berries has been published in the 'Lancet.'§

Tincture of Xanthoxylon Fruits.—Take of Xanthoxylon fruits, bruised, *four ounces;* proof spirit, *one pint*. Digest for fourteen days, express, and filter.

The dose of the powdered bark is from *ten* to *thirty grains*, to be repeated three or four times a day; that of the infusion, from *one* to *four ounces* every four hours. Of the decoction about sixteen fluid ounces may be given, in doses of from two to four ounces, during twenty-four hours.‖ The dose of the tincture of the bark is from *one* to *three fluid drachms*, every three or four hours, or repeated oftener, as frequently as two or three times in an hour where there is great prostration of the system. The tincture of the berries may be given in doses of from *one-half* to *one drachm* frequently repeated.¶ The writer

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* See page 402; and Amer. Journ. Pharm., vol. ii. p. 164.
† See page 403 of present number.
‡ 'Concentrated Organic Medicines,' p. 382.
§ 'Lancet,' Jan. 31, 1863, p. 128.
‖ 'United States Dispensatory,' p. 801; and Amer. Journ. Mat. Med., vol. ii. p. 368.
¶ 'Lancet,' as above.

of the article on Xanthoxylon in the 'Lancet,' says, "that the tincture of the berries, given in drachm doses every fifteen minutes, is by many writers said to be the most efficacious remedy for Asiatic cholera." The dose of Xanthoxylin will vary according to the care in which it has been prepared; it is variously given by different writers as from *one* to *six grains*. The more common dose is from *one* to *three grains*, repeated every three or four hours. On account of its acrid nature, it is best prescribed in a pilular form. Each pill should contain about one grain.

Besides the above preparations an *oil of Xanthoxylon** is imported into this country from North America, where it is prepared by Keith and Co., of New York; as also a fluid extract, a concentrated tincture, and some other preparations of Tilden and Co. The dose of the above oil is from *two* to *five drops*, either dissolved in alcohol, and afterwards combined, if desired with other substances; or suspended in mucilage, or taken up in sugar.† The dose of Tilden's fluid extract is from *fifteen* to *forty drops*, in a tablespoonful of sweetened water.‡ Some consider this as a very eligible preparation. As more than one so-called concentrated tincture has been introduced into this country, we forbear from quoting the dose, as such must necessarily vary according to the strength of the respective preparations. In all cases, we should recommend those who may prescribe Xanthoxylon bark, to order the preparations for which we have given formulæ, as by so doing they can depend upon having definite and reliable forms, instead of uncertain mixtures of doubtful strength.

TO PARENTS AND GUARDIANS.

BY MR. JOSEPH INCE.

Some excitement has lately been evinced on the part of Pharmaceutists on discovering in print a fact of which they had been long cognizant in private,—that they kept a stable and forgot the horse. A remedy of somewhat hazardous character was suggested, which did not meet with much approval; yet, from the discussion which ensued, one fact was brought prominently into notice, that a laboratory, private or public, was an essential requisite in pharmaceutical success; it further transpired that there was a threefold reason why the modern druggist omitted the mainspring from his watch: firstly, he had not sufficient capital; secondly, not sufficient space; and thirdly, not sufficient skill. Why, then, under such manifest disadvantage, did he choose pharmacy at all? The answer to this question may open up a new train of thought, and while in itself it may account for some things hitherto inexplicable, a careful consideration of this painful subject will tend to prevent much future misery. Let us then at once accept the testimony of no few who are now engaged in business—that pharmacy was not their own selection, nor, had they known the consequences entailed, would they ever have chosen it as their career in life. But parents and guardians, with good intentions, but most scanty information, thought in their heart of hearts that its pursuit offered sundry great attractions: it was a genteel and highly respectable avocation, it required but limited means, general knowledge, and eventually a corner-shop. Acting on this (almost universal) theory, the son or ward was bound apprentice, in due time became assistant, and then, if a wife loomed ever so faintly in the distance, the red lamp was hung out in a populous and rising neighbourhood, and there was one druggist more.

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* See page 406 of the present number.

† Coe's 'Concentrated Organic Medicines,' p. 382.

‡ Amer. Journ. Mat. Med., vol. ii. p. 368.

I wish, on this singularly touchy theme, to avoid occasioning the least offence, but I think it right to give expression to a deep regret that the hasty and inconsiderate kindness of parents and guardians is often based only upon good intentions; they can scarcely be aware that pharmacy is a very difficult trade, that it demands thorough training, and that at least some moderate capital is essential. Now, for myself, knowing its difficulties, I should hesitate extremely to allow any friend or relative to enter on its duties who had not had the time and money to pass through a systematic course of lecture-room and laboratory education. Teach things essential, and let details take their chance: indeed, I should tremble were his sole knowledge a certain trade sharpness, and the gleanings at haphazard from his last place.

"Always harping on education" (whispers a dissentient voice); "hammering for ever on a worn-out theme! Did the infatuated writer never hear of the poor errand-boy who knew the three *r*'s (reading, writing, and arithmetic), and by their aid, together with that of his mother-wit, rose to social eminence?" whereat my self-contented questioner, who is not ignorant of turtle or the three per cents., smiles in that placid manner which intimates that he has hit the right nail exactly on the head.

One such youth I well remember,—sharp, persevering, and intelligent. His mission was to vend tea and coffee. To this one point he bent the whole energies of his heart and soul; he helped his master to sell these two articles by day; he dreamt of selling them by night. Scarcely had he bustled from apprentice to assistant, than at an age when most begin to think of a situation he demanded terms of partnership. These were of course refused; but perfectly undaunted, he at once began to keep a country shop, which returned the compliment by keeping him—so well, that like mushrooms springing up over-night, a row of assistants speedily made their appearance behind his counter. One thing ambition cannot manage—to be quietly content; and hence, no sooner did success appear than our prosperous tradesman started a giant shop, huge in proportion, new in arrangement, glaring with gas. A second leviathan establishment quickly followed, while a third in hot haste trod on the heels of its two predecessors.

Great men have freaks: at this critical juncture, in the full tide of daily-increasing wealth, the tea-man left his canisters for a lonely cottage on a still more lonely common. By-and-by the old spirit began to stir within him; commerce once more allured him with the same dulcet notes of tea and coffee. He came to London, being then unknown, took a big corner-shop, encumbered with the usual City rent. Well, he knew that his was a desperate venture, for, from the outset, I believe I am correct in stating that he distanced even Rowland in advertisement. Placards were posted on every convenient and inconvenient spot; bills were distributed by handfuls—they rained into every cab and omnibus, flew on the deck of every river steamboat, and invaded every house. But let those laugh that win; the corner-shop was crowded like a beehive; his tea was brewed in many a hundred tea-pots, and his carts rolled in every direction in and round London. Now his machinery became insufficient for his purposes, besides which it was pronounced behind the age. He determined to increase his stock and use silver cylinders, and like a true enthusiast he sat up one night to witness the fixing of his new apparatus; a week afterwards, as he and others were bending over it, a little silver bolt flew out from the machine, lodged in his forehead, and the Napoleon of his trade fell dead.

I grant you that was success, based on no other learning than spelling and the rule of three: shall we, then, draw the inference that the course of pharmacy already indicated is obviously non-essential? Let us rather consider calmly the fallacy that lurks in the illustration. Such a man, whose history has just been given, could have found no possible develop-

ment for his abilities within the four walls of a druggist's shop. His was a trade that depended on judgment, energy, and push; pharmacy is a special trade—so special, that some call it a profession; nor is it easy to mark the boundary-line that separates the two. The best stock-in-trade for a pharmaceutist is a reputation for first-class articles; such a name once gained is not easily lost; it may be handed down to a successor like a heritage or a bank-note; but to achieve it there is simply one requisite, and that is knowledge. Far be it from me to ring the changes on the value of applied science, but I am bound in honour to tell parents and guardians that in this age of competition, to send out a pharmaceutist without a fair share of such technical book-learning and practical manipulation as is offered in our leading schools of pharmacy, is an unconscious but a terrible injustice. Great and numerous are the advantages placed within the reach of every earnest student; we reap the harvest which our fathers have so generously sown, and poor thanks will it be to them if we neglect an easy victory which they won through patient toil; added to which is the prosaic argument that the neglect does not answer. To expect a man without due qualification to stand his ground against a well-educated, skilled pharmaceutist, would be to run the handiwork of some lumbering country farmer in competition with the triumphs of the last steam-plough.

I think I should further hesitate to establish a new pharmaceutist were his means or space so limited, that having the knowledge, he could not practise the vast economy, as well as enjoy the reputation, of making his own preparations.

There is a certain dignity in self-dependence—a pleasure, in home-made, home-developed skill—an innate satisfaction in success wrung from repeated failure, not to mention the keen enjoyment attendant on discovery. It is the consciousness of these things that serves to gild the weariness of many a lingering hour, helps to make a cheerful business-man, and nerves him with a brave heart manfully to attack his work. For my own part, I confess I like a laboratory, and am never weary of the companionship of pans and stills and furnaces.

I like to see the green plant strewn upon the floor, crushed and evaporated with various technical manœuvres to an extract; and I have far more interest in the product, knowing the trouble of its manipulation and its exact cost, than if I had received something, bearing the same label, and perhaps equally good, but in the production of which I had had no hand. I plead guilty to an honest pride in being the judge of the standard excellence of every article I sell, without being forced to dance attendance on the last crotchet of supposed public fancy, knowing well that that much-maligned public, once sure of the genuine, sets small store by rainbow physic. I like, by constant observation and laborious trials, to get at the best, that is to say, the simplest methods; and in all these two points are gained—economy and credit, together with that which can be obtained by no other means, a thorough business knowledge of the profit and loss of each transaction.

"Qui facit per alium facit per se," is a motto which has its limits; and I must just hint, though with becoming reverence, that the man who never makes his own is sometimes liable to inadvertencies.

A certain reverend divine was accustomed to buy his sermons ready-made, his views were by some termed evangelical, by others low: what were his feelings on finding himself one Sunday morning full swing in a glowing laudation of the saints! The manufacturer had in an oblivious moment chosen the manuscript from the high-church bin.

Let us point the obvious moral of our tale. Parents and guardians should not thrust their sons or wards into pharmacy without due consideration. In

England, the dangerous facility of commencing business is not checked by a compulsory examination and the necessity of a Government sanction; and hence many a man has been made wretched by starting without the requisite fitting preparation, and on too limited a scale. Pharmacy is the last trade that will bear to be insufficiently established, and when so meagrely apportioned, presents the least prospect of a fair remuneration. Don't idly rail against the business, against its poor returns, its narrow scope, and its fatiguing character; give it a fair chance by simply acting on the fact that it wants sufficient money as well as sufficient skill, and these stereotyped complaints will vanish. But when it is crippled in its finances, and the master is in one perpetual fret, the result is far too often an absolute distaste to the employment altogether. The owner loathes the very littleness of his occupation; other expedients are eagerly sought out; and in the weariness of long and unoccupied hours, the complaint is heard from many a sorrowful heart, "Why was I brought up to this?" shall we not rather say, "brought down *to that?*"

26, *St. George's Place, Hyde Park Corner.*

PHARMACEUTICAL COMBINATION AND EQUIVALENT NUMBERS.

BY MR. BARNARD S. PROCTOR.

When any number of men combine to promote or protect common interests, those who are known to the greatest number are naturally chosen as the directors of the general movement.

It happens in our pharmaceutical combination that this proceeding has placed at the post of honour, and in the position of responsibility, a class of men who, while they give weight and respectability to our organization, are probably not most fully alive to the difficulties which beset the more numerous and less prosperous classes of their brethren. The interests of the various branches of the trade are not always alike; all are desirous of being exempted from juries; we cannot say that all are desirous of having the use of methylated spirit restricted or abolished. So we should find, in a score of other subjects, some upon which all agreed, many upon which interests were at variance.

Mr. Reynolds has suggested that, in a case in which a number of the Council find their personal advantage clashing with that of their constituents, the interested parties should stand aside, leaving for the time the management of affairs in the hands of the disinterested portion, who are in a better position for carrying out government to its right result,—that of providing the greatest good for the greatest number.

There are as many different views of a thing as there are beholders, and, however desirous we may be to see, and understand, and appreciate a fact in all its bearings, we rarely, if ever, succeed in forming an estimate which is not influenced, more or less, by the relation which subsists between ourselves personally and the matter under consideration.

This being the case, the management of affairs will be most safely placed in the hands of representatives whose interests are the same as those of the body at large.

If the constituents are one hundred wholesale to one thousand retail, let the Council be in something like the same proportion.

The Society may also be divided into members residing in great towns and in small, in agricultural towns and in manufacturing, in the centres of towns

and in suburbs; and if we could have all these classes present in fair proportions in the Council, their own advantage inducing them to pursue the policy which is best for their electors, we who are out of office would feel it a satisfaction to know that their personal interests were with us, and not against us. At present, wholesale and metropolitan influences are much too strong to give a just balance of power.

While I am thus drawing attention to a state of things which I think should not exist, I feel it necessary to say that I do not know a single member of the Council whose good intentions or good sense I could call in question, nor would I like to see any violent change take place.

If the Council is at present one-half wholesale in its elements, and ought to be only about one-tenth, I think when vacancies occur, those who nominate, and those who vote, should endeavour to select such representatives as will restore to our pharmaceutical combination something like equivalent proportions; and in carrying out a matter of this kind, every voter should know something of the character of the individuals for whom he votes: mere familiarity with the name of a candidate, or the simple fact of some one begging votes for him, should carry no weight. Many names are known to us from their connection with proprietary articles, which connection is not in itself any indication of the fitness of its holder for office; other men, of an officious or brazen disposition, will seek votes through the agency of travellers: this practice is, if anything, an indication of their unfitness for office.

While I am advocating reform movements, perhaps I should not omit the subject of local secretaries; they are now elected annually, but there is so great a dislike to remove any one from an office which he has held for some time, that the question of their fitness, or otherwise, is scarcely entertained: this difficulty, I conceive, would be best overcome by declaring the post vacant, and the election taking place by ballot. A general election of local secretaries once in three years would meet with more attention, and combine more advantages than annual elections, which would too often place the same man in office where a change would be desirable.

11, *Grey Street, Newcastle, February*, 1863.

REPORT OF THE
RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS,
AND OF THE
APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

Chemical Separation produced by Capillarity.—M. Schönbein has described some curious experiments upon the capillarity of solutions of different substances. He employed sheets of white, unglazed paper, which were suspended at right angles to the surface of the liquid, and immersed to the depth of two or three millimetres. They were maintained in this position until the liquid had risen to a height of three centimetres.

Alkaline solutions.—A paper, coloured with turmeric, was placed in a one per cent. solution of potash; the first two centimetres became reddish-brown, but the third preserved its yellow tint, although moistened by the liquid. An analogous result may be obtained with litmus paper previously reddened; the lower part only passes to blue, and the third centimetre preserves its red tint. These reagents are so delicate, that it may be affirmed that no trace of potash reaches the place where the colour is not altered. It must be admitted therefore that the superior part of the paper contains pure water, which has been separated from the potash by the capillary force.

Soda and lithia produce nearly the same results. With a saturated solution of baryta, the second and third centimetres remain unaffected in colour. A saturated

solution of strontia, or lime, only modifies the first three or four millimetres of the paper.

Acid solutions.—A sheet of blue litmus paper was placed in sulphuric acid of one per cent.; the first eighteen millimetres passed to red, the twelve following millimetres became moist, but remained blue.

The same result was obtained with nitric acid. With a one per cent. solution of phosphoric acid, however, the change of colour took place as far as the liquid went; the acid and water in this case were not separated therefore. Hydrochloric, oxalic, and tartaric acids behaved like sulphuric acid.

A sheet of paper placed in a one per cent. solution of gallic acid, and afterwards immersed in a persalt of iron, is blackened for the first nine millimetres; the remaining twenty-one are not affected.

Saline solutions.—If a sheet of paper, which has been hanging in a one per cent. solution of a persalt of iron be dipped into gallic acid or ferrocyanide of potassium, the lower part is coloured, the superior part remains unaffected. If a paper, into which a one per cent. solution of nitrate of lead has soaked, be placed in an atmosphere of sulphuretted hydrogen, the lowest three-fifths become coloured, the two upper are unaffected. Analogous results are obtained with salts of silver, copper, and cadmium. A piece of paper wetted with an alkaline solution of iodide of potassium (one per cent. of potash, and two per cent. of iodide) does not become brown when put in ozonized air; but if the solution be allowed to rise in the paper by capillarity, as in the other cases, to three centimetres, and the humid paper then placed in ozonized air, the lowest portion remains colourless, and the part above it is coloured, excepting a narrow band at the top, which remains colourless. This experiment proves that potash, iodide of potassium, and water are imbibed by paper with different degrees of intensity; the water goes furthest, the iodide next, and the potash least.

Colouring matters.—A paper suspended in solution of sulphate of indigo has the lower portion only coloured. The upper part remains colourless, but is not equally composed, one portion being acid, while the other is neutral.

The Analysis of Waters.—A communication has recently been made to the Chemical Society by Mr. Edward Nicholson, a staff assistant-surgeon at Fort Pitt, Chatham, on a volumetric process for the analysis of waters, which has attracted some attention among those interested in the subject, from the fact that it professes to afford the analyst the means of completely analysing a water in the space of three or four hours,—an operation which has hitherto required several days for its performance. If really accurate and trustworthy therefore, Mr. Nicholson's method would prove a great boon to chemists. Unfortunately, however, it is open to some serious objections, and contains some very obvious errors, which are likely to destroy its utility in its present form; nevertheless, it may, by directing attention to the subject, lead to further investigation.

The outline of Mr. Nicholson's process may be stated as follows:—

1. Take 50 c.c. of the water, and determine its hardness by soap-test in the usual manner. This hardness is due to free carbonic acid, lime, magnesia, and iron.

2. Take 50 c.c. of the water, and evaporate to dryness with a few drops of sulphuric acid, and ignite the residue. Dissolve this in 50 c.c. of distilled water, and ascertain the hardness. By this operation the free carbonic acid is removed, and the iron, which is rendered insoluble, separated; the hardness is therefore due to the lime and magnesia only.

3. Take 50 c.c. of the water, add 50 c.c. of a standard solution of oxalate of ammonia; after a time filter, determine the oxalate left in solution by a standard solution of permanganate. By this operation the amount of lime is ascertained; by the previous operation the amount of lime and magnesia was determined: the difference gives the magnesia.

4. Take 50 c.c. of the water, evaporate to dryness with a few drops of sulphuric acid, and ignite. Dissolve the residue in 50 c.c. of distilled water; add 50 c.c. (or more) of a standard solution of nitrate of baryta, of which the hardness also is known. Take the hardness of the mixture. If no alkaline sulphates are present, the amount of lime and magnesia in solution will be exactly equivalent to the baryta precipitated as sulphate; and the hardness, when ascertained by the soap solution, will be exactly that

of the baryta solution added. But if sulphates of alkalies are present, baryta will be precipitated without any *hard* base taking its place. The hardness of the solution will then be less than that of the baryta solution added. From this difference the amount of soda in the water is ascertained. (Mr. Nicholson calculates the alkalies as all soda.)

5. Determine the chlorine by a standard solution of nitrate of silver.

6. Add to 50 c.c. of the water 10 c.c. of the standard solution of nitrate of baryta, and ascertain the hardness of the mixture. The loss of hardness from the precipitation of sulphate of baryta indicates the amount of sulphuric acid.

7. Determine the iron by means of permanganate of potash.

Such are the analytical principles upon which the method is based. The manipulation is rendered very easy, and all calculation is avoided, by the manner in which the strength of the soap-test and the standard solutions is arranged.

The burettes employed are divided into tenths of cubic centimetres or degrees, each 0·1 c.c. = 1 degree. These, with two pipettes of 10 c.c. and 50 c.c. respectively, a few basins and beakers, a few three-ounce stoppered bottles, and a graduated litre-measure, form all the apparatus required.

The soap-test is prepared by dissolving the soft soap of the Pharmacopœia in proof spirit. The strength is so adjusted that 20 degrees (2 c.c.) are exactly equivalent to 50 c.c. of a water containing 0·1 grm. per litre of carbonate of lime; and on adding to 50 c.c. of such a water, 22 degrees (2·2 c.c.), a permanent lather is produced by agitation. This requisite excess of 2 degrees per 50 c.c. is to be deducted from all determinations of hardness.

The solution of nitrate of baryta is made to contain 1·3 grm. per litre; 50 c.c. of it mark 100 degrees.

The solution of nitrate of silver contains 8·500 grms. (one-twentieth of the equivalent of the salt) per litre.

The solution of oxalate of ammonia, contains 0·355 grm. (one two-hundredth of the equivalent of the salt) per litre.

The solution of permanganate of potash contains 0·159 grm. (one-thousandth of the equivalent of the salt) per litre. 50 c.c. of this solution should be exactly sufficient to oxidize 50 c.c. of the oxalate of ammonia solution.

The above graduation of the solutions has been adopted, as the important advantage is thereby obtained of being able to calculate the quantity of any substance per litre of water, by multiplying the number of degrees of test used by the atomic weight of the substance. Thus—

20 degrees × 50	(eq. of $CaO.CO_2$)	= ·1000 grm. per litre, of carbonate of lime.
20 degrees × 28	(eq. of CaO)	= ·0560 grm. per litre, of lime.
20 degrees × 35·5	(eq. of Cl)	= ·0710 grm. per litre, of chlorine.

The quantities thus obtained, when multiplied by 70, show the number of grains per gallon of water.

The advantage of these graduations will be sufficiently seen by applying them to operations 3, 4, and 6.

3. To 50 c.c. of the water add 50 c.c. of the solution of oxalate of ammonia,—digest and filter; acidulate the solution with hydrochloric acid, heat to 70° C., and add permanganate from burette until oxidation of the excess of oxalic acid is complete; subtract the number of cubic centimetres of permanganate employed from the 50 c.c. of oxalate of ammonia added: the difference gives the number of degrees of lime.

4. To 50 c.c. of water, ignited with SO_3HO, as described, add 20 c.c. of the nitrate of baryta solution. Take the hardness, 20 c.c. of the baryta solution, equals 40 degrees. If there are no alkalies, the hardness of the mixture will be 40. Supposing the hardness however to be reduced to 36 degrees, that will show 4 degrees of alkaline sulphate present.

6. To 50 c.c. of the water add 10 c.c. of nitrate of baryta solution; take the hardness. The hardness of the baryta solution added is 20; suppose the hardness of the water to be 36·8. These together make 56·8. If the hardness found be 52, it will indicate 4·8 degrees of sulphuric acid.

The following results were obtained from the water of the Chatham Company:—

	Degrees.	
1. Hardness	53·7	Carbonic acid gas. Calcium. Magnesium. Iron.
2. Hardness after ignition with sulphuric acid	49·7	Calcium. Magnesium.
3. Calcium ascertained by permanganate	48·3	Calcium.
4. Hardness after ignition with sulphuric acid, solution, and 60 degrees of baryta added	53·6	(Loss 6·4° = Sodium.)
5. Chlorine	5·5	
6. No sulphuric acid.		
7. Iron	0·2	

By deducting the 48·3 of calcium from the 49·7 of Ca and Mg, 1·4 of magnesium is obtained. By deducting the 49·7 of Ca and Mg and the 0·2 of Fe from the 53·7 of total hardness, 3·8 of carbonic acid gas is obtained. These give—

Calcium	48·3	degrees.
Magnesium	1·4	,,
Sodium	6·4	,,
Iron	·2	,,
Chlorine	5·5	,,
Carbonic acid gas	3·8	,,

By multiplying these degrees by the equivalents of the bodies, the number of grammes per litre are obtained. By this means the elements may be combined, and at once expressed in the form in which they exist in the water. Thus the 5·5 degrees of chlorine are combined with an equal number of degrees of sodium; a balance of ·9 degrees sodium is left. This, with the calcium and magnesium, is calculated as carbonate.

	Degrees.	Equivs.	
Ca	48·3 ×	50	= ·2415 of carbonate of lime.
Mg	1·4 ×	42	= ·0058 of carbonate of magnesia.
Na	·9 ×	53	= ·0047 of carbonate of soda.
Cl	5·5 ×	58·5	= ·0321 of chloride of sodium.
Fe	·2 ×	80	= ·0016 of oxide of iron.
Grm. per litre ...			·2877

CO_2 ..... 3·8 × 44 = ·0167 = 8·93 c.c. of carbonic acid.

By multiplying these grammes per litre by 70, the grains per gallon are obtained.

Such is Mr. Nicholson's process. It is much to be regretted that he has given no comparative results obtained by this method and the ordinary gravimetrical processes, for it is only by such means that any just opinion of its value can be formed. It will be seen that he makes no mention of two most important constituents of waters, namely, organic matter and nitrates. Following literally the author's instructions, the first of these would be put down as magnesia, and the latter as carbonates!

At a recent meeting of the Chemical Society, Dr. Paul pointed out several other objections to which this method is liable. He showed that free carbonic acid in a water is incapable of decomposing its equivalent of soap, and therefore could not be estimated by the same means as an earthy base. Mr. Dugald Campbell, moreover, has long ago pointed out that magnesia is not equivalent to lime in soap-decomposing power. Dr. Paul also showed that by Mr. Nicholson's process, the New River water yields no sulphuric acid, while analyses by Graham and Hofmann have shown it to contain several grains of this substance. This appears to arise from the fact that nitrate of baryta is incapable of giving any precipitate in the unconcentrated water.

ON MAUVE AND MAGENTA.

BY DR. A. W. HOFMANN, F.R.S., PRES. C.S.

(*Lecture delivered at the Royal Institution of Great Britain, April* 11, 1862.)

(*Concluded from page* 326.)

But it is time for us to return to the point from which we started. What has the recognition of our types to do with the distillation of coal? In what manner do they explain the formation of the variety of substances generated in this process. In coal we have the elements of the three types of matter, and we find that hydrogen, water, and ammonia are in fact produced to a very appreciable extent during its distillation. The quantity of free hydrogen is generally small; moreover, mixed as it is with the carbonetted hydrogens of coal-gas, its presence among the products of distillation of coal is not easily demonstrated by experiment. Water and ammonia, on the other hand, are abundantly generated, and nothing is easier than to exhibit their production. In fact, the coal-tar-oil, which we have produced in our distillation-experiment, is covered, as you observe, with a layer of water, and the application of test-papers to the latter shows that it contains a large amount of ammonia. Now consider that our types are generated from coal in the presence of large quantities of carbon and hydrogen, two elements which, in proportions varying to an almost unlimited extent, may aggregate under the influence of heat to compound atoms similar to ethyl and phenyl; remember, moreover, that these atoms are capable of displacing, partly or entirely, the hydrogen of our types, and you will realize without difficulty the number of compounds which may be formed by the distillation of coal; I say which may be formed, for the diagram which I have exhibited to you enumerates only the bodies which have actually been obtained; but every day brings forth new substances. It is obvious that the nature of the compound atoms generated must, in a measure, depend upon the composition of the coal distilled. The composition of coal, however, varies between very considerable limits. In the subjoined diagram I give you a synopsis of the results obtained in the analysis of several specimens of coal.

ANALYSIS OF DIFFERENT COALS.

Locality of Coal.	100 PARTS OF DRY COAL						
	Contain					Leave	
	Carbon.	Hydrogen.	Nitrogen.	Sulphur.	Oxygen.	Ash.	Coke.
Anthracite, Wales . . .	91·44	3·36	0·21	0·79	2.58	1·52	92·20
„ „ . . .	90·39	3·28	0·83	0·91	2·97	1·61	92·10
Caking Coal, Newcastle .	81·41	5·83	2·05	0·75	7·90	2·07	66·70
Cannel Coal, Wigan . .	80·07	5·53	2·12	1·50	8·09	2·70	60·36
Coal, Wolverhampton . .	78·57	5·29	1·84	0·39	12·88	10·30	57·21
Wallsend, Elgin . . .	76·09	5·22	1·41	1·53	5·05	10·70	58·40
St. Helen's, Lancashire .	75·80	5·21	1·92	0·90	11·89	5·17	65·50
Methill Brown Coal . .	65·96	7·78	0.96	0·75	9·23	15·32	
Bohemian Brown Coal .	55·59	4·16	19·06			21·19	

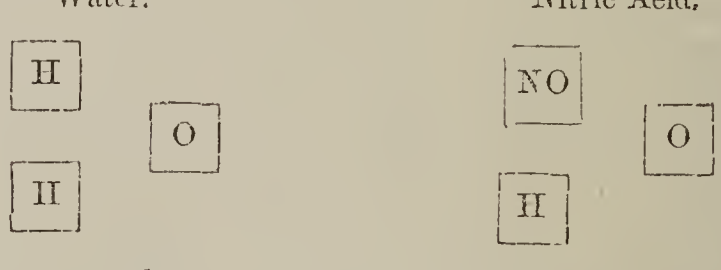
A glance at this diagram shows you that the carbon in the several specimens varies by more than 30 per cent., being 91·4 in Welsh anthracite and 55·5 in Bohemian brown coal. Similar, though less marked, discrepancies are perceptible in the other constituents. If you recollect, in addition, that the nature of the compound atoms generated in the distillation of coal must be influenced, moreover, by the temperature, which again oscillates between limits widely apart, you cannot fail to perceive that the destructive distillation of coal must be an almost inexhaustible source of new compounds.

The separation of the individual substances from the complex mixture called coal-tar-oil appears, at the first glance, to present almost insurmountable obstacles. But the principles made use of for this purpose are very simple. The individual compounds contained in coal-tar-oil may be separated in a great measure by distillation, their boiling-points varying, as may be seen by a glance at the diagram, to a considerable extent. But additional means of purification offer themselves in the different deportment which these substances exhibit under the influence of chemical agents. I could not perhaps, in this respect, bring under your notice a more instructive illustration than the behaviour with acids and bases of the three coal-tar-oil constituents, repeatedly quoted. Benzol, phenol, and aniline may thus easily be separated. To demonstrate this point experimentally, two glass cylinders have been half-filled with benzol, two others with phenol, and two further ones with aniline; a solution of litmus having, moreover, been added, each of the three substances is treated in one cylinder with acid, in the other with alkali. In the case of the benzol, you observe, the indifferent hydrocarbon, insoluble both in acid and alkali, floating colourless upon the coloured liquid; phenol, being an acid water-derivative, is not acted upon by the acid, but readily dissolves in the alkali; aniline, lastly, being a well-defined ammonia-derivative, exhibits the converse deportment, resisting the action of the alkali and forming a homogeneous solution with the acid.

Each of the three coal-tar-oil constituents which I have mentioned, and of which you have characteristic specimens upon the lecture-table, has received important applications in the arts and manufactures. Benzol is the most convenient solvent for caoutchouc; as an agent for removing oil and grease it has become an ordinary household article; phenol, when treated with nitric acid, yields us a beautiful yellow dye, called by chemists carbazotic acid, but the practical interest attached to phenol you will more immediately appreciate if I tell you that this compound presents the greatest analogy with creosote, a substance, I am afraid, but too well known to most of us,—a considerable portion of the creosote of commerce being in fact simply phenol; aniline, lastly, is the source of Mauve and Magenta, and must therefore claim our attention more particularly this evening.

The amount of aniline which exists in coal-tar is very limited; a preparation from this source upon a sufficiently large scale could never be attempted. Fortunately chemists are in the possession of a series of processes by which aniline may be produced in any quantity. Benzol, the phenylated hydrogen, may readily be converted into aniline, the phenylated ammonia. Let us examine this transformation experimentally.

Benzol is readily attacked by fuming nitric acid; it dissolves in it, producing a liquid of a deep-red colour. On addition of water this liquid deposits a heavy yellow oil, collecting at the bottom of the cylinder, perfectly different from benzol, which floats on the surface of the water. The reaction will be intelligible to you, if I remind you that nitric acid, when referred to our types, must be viewed as a water-derivative; it is water in which, for one of the elementary hydrogen-atoms, there has been substituted a compound atom, consisting of nitrogen and oxygen.



Modern chemistry, you observe, returns to the conceptions of former ages, which in the name *aqua fortis* appear to have anticipated in a measure our present notions.

When nitric acid acts on benzol, an interchange takes place between the elementary atom of the latter and the compound atom of the former, *nitrobenzol*, the heavy yellow liquid, which we have produced, and water being formed:—

Benzol. Nitric Acid. Nitrobenzol. Water.

$$(C_6H_5)H + \left.\begin{matrix}NO_2\\H\end{matrix}\right\} O = (C_6H)(NO_2) + \left.\begin{matrix}H\\H\end{matrix}\right\} O$$

The transformation of benzol into nitrobenzol, discovered by Mitscherlich, is only a preparatory operation for the production of aniline. The method of converting nitrobenzol into aniline was discovered by Zinin. It consists in submitting nitrobenzol to the action of nascent hydrogen. Under the influence of this agent, the compound atom NO_2, which in nitrobenzol is associated with phenyl, is decomposed; its oxygen is converted into water, the residue of nitrogen and phenyl assimilating the necessary quantity of hydrogen to form phenylated ammonia, or aniline.

Nitrobenzol. Hydrogen. Water. Aniline.

$$(C_6H_5)NOO + HH + HH + HH = \left.\begin{matrix}H\\H\end{matrix}\right\}O + \left.\begin{matrix}H\\H\end{matrix}\right\}O + \left.\begin{matrix}(C_6H_5)\\H\\H\end{matrix}\right\}N$$

The hydrogen necessary for this transformation may be furnished by numerous processes. The most convenient method for our purpose consists in submitting nitrobenzol to the action of metallic iron and acetic acid,—a process first proposed by M. Béchamp. I mix the three bodies in a glass retort, and on application of a gentle heat you observe how immediately a most powerful reaction manifests itself. Let us hasten to connect the retort with a condenser; I have removed the gas-burner from the retort; nevertheless the reaction continues, and a considerable quantity of water, covering an oily layer, has already accumulated in the receiver. This oily liquid is *aniline*. We recognize it at once by its peculiar deportment with a solution of chloride of lime. On pouring a single drop of our distillate into this beaker, which contains a solution of chloride of lime, a splendid purple cloud is almost instantaneously diffused throughout the liquid. You perceive we are approaching our subject. The beautiful colour which aniline strikes with a solution of chloride of lime has been long known. A solution of bleaching powder has always been used as a test for aniline; indeed it was by this colour-reaction that the presence of our compound in coal-tar-oil was first pointed out, a fact recorded in the name *Kyanol* (blue oil), originally given to aniline prepared from coal-tar. Several other oxidizing agents, chromic acid for instance, were likewise known to produce coloured compounds from aniline; but all the colours thus obtained were of a highly ephemeral character. Observe how the purple cloud which I produced by means of chloride of lime has rapidly changed to a dingy reddish precipitate. It was Mr. W. Perkin who had first the happy idea of investigating the circumstances under which this beautiful purple might be prepared in a form permanent and applicable for the purposes of the dyer. He succeeded in isolating this colour by submitting, under appropriately selected circumstances, aniline to the action of bichromate of potassium and sulphuric acid.

Here then you have, step by step, the development of this new and important branch of chemical industry.

Through the kindness of my friend Mr. Perkin, I am enabled to exhibit to you magnificent specimens of his aniline purple, or Mauve, in the dry state and in solution. This brown lump, with the remarkable coppery lustre, is Mauve in the solid state; its extraordinary tinctorial powers will be appreciated, if I tell you that this beautiful violet-coloured solution contains not more than $\frac{1}{10}$ of a grain of Mauve in one gallon of alcohol; you will also understand the considerable commercial value of this substance. Weight for weight, I am told by Mr. Perkin, this colouring matter, when pure, is sold at the price of metallic platinum.

Very little is known regarding the chemical nature of Mauve; its composition is not yet made out, and as a matter of course the process by which it is formed from aniline remains as yet perfectly unexplained.

Magenta is one of the fancy names given to the splendid crimson, which is likewise generated from aniline by the action of oxidizing agents. This substance was first observed in purely scientific researches, and more especially in the action of tetrachloride of carbon upon aniline. To a French chemist, M. Verguin, the merit is due of having for the first time obtained this substance on a larger scale; he produced it by the action of tetrachloride of tin on aniline. Numerous other processes were subsequently suggested, among which treatment of aniline with chloride or nitrate of mercury, with arsenic acid, and many other substances, may be mentioned. Magenta, often called fuchsine, roseine, etc., soon became an article of large consumption. A great impetus

to this new branch of industry was given in France by Messrs. Benard and Franc, who were the first to manufacture the new article on a commercial scale; in this country, very soon afterwards, Messrs. Simpson, Maule, and Nicholson engaged with great spirit in the manufacture of this splendid dye, the production of which has attained already colossal proportions. To Mr. E. C. Nicholson more especially belongs the credit of having developed this new industry to an unprecedented degree of perfection.

Before proceeding, however, let me show you the formation of Magenta by experiment. Among the many processes which I might adopt for this purpose I select the action of corrosive sublimate upon aniline, not because I consider this process superior to the others,—it is, in fact, inferior to many,—but because it is, perhaps, the best adapted for a lecture-experiment. This white powder is chloride of mercury (corrosive sublimate); a small portion of this salt I mix in a test-tube with perfectly colourless aniline. Let us stir the mixture with a glass rod until it is converted into a perfectly homogeneous liquid paste. This paste is still colourless, but on gently heating it by a gas-burner, it instaneously assumes a splendid crimson of the greatest intensity, a single drop of the liquid being capable of deeply colouring a large beaker filled with alcohol.

In all the processes which convert aniline into colouring matters, a considerable number of secondary products are generated, which it is rather difficult to separate from the principal product of the reaction. These difficulties have been most perfectly overcome by Mr. Nicholson, who has succeeded in obtaining Magenta in a state of absolute purity. Chemists have thus been enabled to analyse this substance, and to lift, at all events, the corner of the veil which still covers the mysterious formation of the coloured derivatives of aniline.

In the pure state Magenta is a fine crystalline, and, remarkably enough, perfectly colourless, or only slightly tinted body, which is represented by the formula—

$$C_{20}H_{21}N_3O = C_{20}H_{19}N_3,H_2O.$$

Rosaniline (this is the name by which chemists designate the colourless body) is a base, or ammonia-derivative, which forms a series of splendid salts. With hydrochloric acid, for instance, it produces a beautifully crystalline salt of the formula—

$$C_{20}H_9N_{13},HCl.$$

It is in the state of saline combination that rosaniline acts as a crimson dye. Into this shallow porcelain dish I have thrown a few crystals of rosaniline, which at a distance you scarcely perceive; I now pour upon these crystals a small quantity of acetic acid, when, on gently heating the dish, the crimson colour instantaneously appears. But it is only *in solution* that even the salts of rosaniline are crimson-coloured; on slowly *evaporating* their solution, the red colour entirely *vanishes*, and a splendid green crystalline substance remains, presenting in an extraordinary manner the beautiful metal-lustre which distinguishes the wings of the rose-beetle. Together with all the products involved in the manufacture of aniline and aniline-dyes, my friend Mr. Nicholson has placed before you the finest series of rosaniline-salts which has ever been produced; and not content with this display, he was kind enough to send us a specimen of acetate of rosaniline, such as no mortal eye has ever seen before. The specimen may be literally called the *Crown of Magenta*.* Crowns are always expensive articles, and often are the cost and trouble of getting them greater than their actual value. This remark applies in a measure to the Crown of Magenta. For the benefit of those who are fond of big figures—and who is not a little afflicted with this weakness?—I may state that the crown was grown in a vessel containing not less that £8000 worth of Magenta, the crown itself being worth upwards of £100.

Having now explained the several stages of transition through which coal has to pass before it becomes either Mauve or Magenta, it may be of some interest to you to know the proportion which the finished dye bears to the coals from which it is derived. A set of specimens, for which I am likewise indebted to Mr. Nicholson, is most instruc-

* An immense aggregate of sparkling green octohedral crystals,—some of them as much as an inch in diameter,—deposited upon a large wire frame having the shape of an elegant crown, was here exhibited.

tive in this respect. Observe, it commences with a large mass of coal, weighing not less than 100 lbs.; the bottles which follow contain the coal-tar-oil, naphtha, benzol, nitrobenzol, and aniline, obtainable in succession from 100 lbs. of coal; remark how they gradually diminish in size, and how small, I might almost say insignificant, appears the bulk of Magenta finally obtained. But compare the bulk of wool which this minute quantity will dye. It approximates to the bulk of coal with which we started. This comparison evinces perhaps sufficiently the extraordinary tinctorial power which this class of dyes possesses, but a very simple experiment may possibly convey to you this idea even in a more impressive manner. The white paper which covers this large frame has been dusted over with a minute quantity of Mauve; a second one is treated in a similar manner with Magenta. The quantity of colouring matter is so small, that the paper has retained its original white colour, but observe how it changes, when I dash a beaker full of spirit against these squares; immediately the lovely purple of Mauve is developed upon one of them, whilst the other one exhibits the dazzling crimson of Magenta.

But let us now proceed to illustrate the mode of dyeing. For this purpose I introduce silk and wool, both unspun and woven, in succession, into solutions of Mauve, of Magenta, and lastly of a splendid new Purple, lately discovered by Mr. Nicholson. Observe the extraordinary facility with which the coal-tar-colours are fixed both on wool and silk. These materials require no previous preparation, being dyed, in fact, simply by dipping, without the aid of any mordant. Silk and wool are animal substances; vegetal materials, such as cotton and linen, unless previously submitted to a special treatment, are scarcely affected by these dyes. This fact admits of being beautifully illustrated by dyeing linen fabrics on which ornaments have been embroidered in silk ribbon. The articles, when coming out of the bath, appear uniformly dyed; but by washing, first in pure water and then in dilute ammonia, the colour rapidly vanishes from the linen ground, leaving the silk embroidery in brilliant colours. This extraordinary predilection of the aniline-colours for animal substances is, moreover, strikingly illustrated by the condition of my hands, which by this time have acquired a thoroughly Magentic appearance. Fortunately the coal-tar-colours are unable to resist the action of chloride of lime, and I have therefore only to immerse my hands for a moment into a solution of bleaching powder.

Already the colour on my hand, you observe, has gone, but with the colour, I am afraid, my time too. Let me endeavour to bring this lecture to a conclusion. I have fulfilled in a measure the promise which I gave you at the commencement of this discourse. We have crossed together the extensive field which stretches between *coal* and *colour*. I am impressed, deeply impressed, with the clumsiness of my performance as your guide, but I hope that the interest attached to the territory we have explored may, to some extent at all events, have indemnified you for the imperfection of my explanations, and that you leave the Royal Institution this evening with the kind of feeling every one of us has more than once experienced after travelling in similar company over a beautiful country—the guide is forgotten, but the impression of the scenery remains.

Having gone thus far, you may think that it is fully time for me to make my bow. But I venture, even at this late hour, to dwell for a moment on the *moral* of the story which I have told you, though you may feel disposed to consider this story rather a highly-coloured one.

The material which I had to condense, I might almost say to force, into the short space of an hour, has been overwhelming; and whilst explaining the formation of the various substances which I had to describe, whilst illustrating their properties by experiment, I have scarcely had time to glance at the history of our subject. This history is not without interest. You readily perceive that a branch of industry like the one I have endeavoured to sketch could not possibly have risen like Minerva from the head of Jupiter—a sudden inspiration happily realized. The time, the toil, the thought of a host of inquirers were necessary to accomplish so remarkable an achievement. You cannot expect me at this late hour to examine minutely into this part of the subject, but I must not take leave of you without alluding to some facts which cannot fail to rivet the lively interest of the Members of this Institution. Let me tell you then that Mauve and Magenta are essentially Royal Institution colours; the

foundation of this new industry was laid in Albemarle Street. Benzol, which I have so repeatedly mentioned,—benzol, which may be looked upon as the raw material, capable under the influence of chemical agents, of assuming such wonderful shapes,—benzol is the discovery of our great master,—may I not add of our kind friend?—Mr. Faraday. This volume, 'The Philosophical Transactions for 1825,' contains the description of his experiments. In 1825, thirty-seven years ago, the laboratory of the Royal Institution witnessed the birth of this remarkable body. Yesterday, under the auspices of Mr. Anderson, I invaded the same laboratory, a diligent search was made, and in my hand I hold the trophies of our expedition, the original specimens of benzol which Mr. Faraday prepared. In thus reminding you of one of the early labours of Mr. Faraday, which, owing to the number and vastness of his subsequent discoveries, appears almost to have escaped from his memory like a tradition of years gone by, I have opened a glorious page in the glorious history of the Royal Institution. Benzol has furnished us Mauve and Magenta, but it has done much more than this. Ever since chemistry became endowed with this wonderful body, benzol has been the carrier of many of the leading ideas in our science. In the hands of Mitscherlich, Zinin, Gerhardt, and Laurent, in the hands of Charles Mansfield—never to be forgotten by his friends—and many others, benzol has been a powerful lever for the advancement of chemical science. Benzol and its derivatives form one of the most interesting chapters in organic chemistry, the progress of which is intimately allied with the history of this compound.

But what has the history of benzol to do with the moral of Mauve and Magenta? Well, ladies and gentlemen, ask Mr. Faraday; ask him what in 1825 was his object in examining benzol. I have perhaps no right to answer this question in Mr. Faraday's presence; but I venture to say that we owe his remarkable inquiry to the pure delight he felt in the elaboration of truth. It was in the same spirit that his successors continued the work. Patiently they elicited fact after fact; observation was recorded after observation; it was the labour of love performed for the sake of truth; ultimately, by the united efforts of so many ardent inquirers, exerted year after year in the same direction, the chemical history of benzol and its derivatives had been traced. The scientific foundation having thus been laid, the time of application had arrived, and by one bound, as it were, these substances, hitherto exclusively the property of the philosopher, appear in the market-place of life.

Need I say any more? The moral of Mauve and Magenta is transparent enough. I read it in your eyes,—we understand each other. Whenever in future one of your chemical friends, full of enthusiasm, exhibits and explains to you his newly-discovered compound, you will not cool his noble ardour by asking him that most terrible of all questions, "What is its use? Will your compound bleach or dye? Will it shave? May it be used as a substitute for leather?" Let him quietly go on with his work. The dye, the lather, the leather will make their appearance in due time. Let him, I repeat it, perform *his* task. Let him indulge in the pursuit of truth,—of truth pure and simple,—of truth, not for the sake of Mauve, not for the sake of Magenta,—let him pursue truth for the sake of truth!

REMARKS ON THE OÏDIUM, OR VINE DISEASE.

BY JOHN MACKAY, F.R.S.S.A.,

Vice-President and Pharmaceutical Chemist, Edinburgh.

From an important communication read before the Royal Scottish Society of Arts, entitled as above, we extract the following interesting particulars of the History, Characteristics, and Remedies of the Vine Disease:—

HISTORY.—"The first appearance of the Oïdium was in England during 1845. Edward Tucker, a gardener in Margate, was the first to observe and notice it; and hence it is to this day known under the name of '*Oïdium Tuckeri.*' First appearing in Margate, it traversed Kent, and appeared in some other counties in England. In the course of a few years, it was found in France, and made its way up the Mediter-

ranean, destroying the currant or small variety of grape with its blight, as completely and in the same manner as the common grape. In 1853 it appeared in Spain, and was so destructive, that instead of 70,000 butts of wine, of an average value of £7 a butt, being shipped from Cadiz in one year, the quantity shortly fell to 18,000, at an increased value of £16 per butt. About a year later, it appeared in Portugal, and reduced the annual production of wine from 90,000 pipes to betwixt 18,000 and 19,000. Madeira, as is well known, was long famous for the very superior wine it produced. Vines from all quarters readily took root, grew, and flourished, on its volcanic hills, and that with so much success, that the annual production of first-class wine was about 22,000 pipes. The *Oïdium* first showed itself at Madeira in 1851, and infested every part of the island. The following year, the grapes were entirely destroyed, and the plants themselves almost completely annihilated. With very few exceptions all were lost, and those which did remain failed to bring the fruit to maturity. For six consecutive years no vintage was gathered, and, as will doubtless be remembered by many, much suffering and misery were caused among the inhabitants, and at length the vineyards were rooted up and planted with sugar-cane. Year after year the export of this wine from the island became less, until we may now fairly say that the supply has entirely ceased. An attempt was made in 1858 to obtain fruit and manufacture wine. The result was the production of about 600 pipes of very inferior stuff, since which time no further effort has been made, and the trade appears almost at a close."

Characteristics.—"Some allege that the Oïdium is produced by diseased mould, which gathers round the base of the plant, and finds its way into the circulation; others, that it is owing to a certain state of the atmosphere, or from some peculiar action in the interior of the vine at particular times; or, again, that certain electric currents in the earth or in the air produce the abnormal condition; or that wet, cold, damp weather, when the vine has advanced to a certain stage, produces the disease. But while the cause is still wrapped in mystery, and conjecture busy at work, of this there can be no doubt, that its leading features or characteristics are precisely the same, whether these be observed at home or abroad. From all that has been known, I think it is undoubtedly a fungoid disease propagated by excessively minute sporules, affecting both the young plant and the more advanced fruit."

The following description of the disease is given from observations by Mr. Harris:—

"When the shoots are struck, they become spotted with dark cinereous or ferruginous-coloured spots; the leaves also become dark and spotted, but are found, on examination, to be covered with a species of a white cottony-looking substance, which, when seen by the microscope, is exactly in appearance like that on the fruit. The grapes, when blighted, are covered with what appears to be a white powder-like lime, a little darkened with brown or yellow. I may here remark, that whenever a white spot appears, be it ever so small, the disease is developed; because, if the white powder or speck be removed, and the spot examined with a lens, we see the brown or black marks very minute, but very distinct and highly characteristic. These fungi send forth laterally, in all directions, thread-like filaments, which become so completely interwoven with each other as to entirely cover and enclose the skin of the grape in a compact and firm network, and on each is seen the egg-shaped capsule or seed-pod.

"The pips and juice go on swelling, and at times, when struck late in the season, the grape becomes partially ripe and coloured; but very soon, expansion from within going on, checked by this network without, the fruit bursts; but as it cannot do so as if it were unconfined, the edges of the part where it gives way turn inwards, and the pips are exposed to view, not unlike the teeth of a man when the lips are drawn back. If struck at a more early stage, they shrivel up, dry, and fall off, becoming frequently very offensive, and of course useless."

Remedies.—"I now come to speak of the remedies which have from time to time been proposed for the cure and prevention of the Oïdium. Bonchardat, an eminent French botanist, alleged that the disease arose entirely from the forced or early cultivation of the vine, and that the enemy found its way from the hothouse or conservatory, to the plants in the open air. This was soon found to be erroneous, and applications were sought for, which would be alike useful to the early and the late grape, whether reared under cover or grown in the open vineyard. The various substances

and preparations, fairly tried for this purpose, were the following:—Flowers of sulphur, sulphur in combination with lime, mineral tar, common salt, turpentine, sulphate of iron, sulphurous acid, and the penta-sulphide of calcium. The earliest and most successful application for the destroyal of these parasites was a mixture of lime and sulphur in hot water, constituting an impure sulphuret of calcium, or perhaps, more correctly, a mixture containing sulphate of lime and sulphuret of calcium. On its application, sulphuretted hydrogen was given off, and a white yellowish pellicle, smelling of sulphur, was deposited on the plant, thus giving some permanence to the remedy. It is, however, undeniable, that none of the means, proposed or tried, equal the free application of sublimed sulphur, applied directly to the plant. Not that one dose is always successful; but a second, or a third, if it be required, is invariably the means of destroying the fungus. In a few of the districts in Portugal, it is, I believe, true, that even up to the present time, the sulphuret of calcium is preferred and used; but these are merely exceptional cases.

"The mode of using the antidote, or cure, is to moisten the plant by means of a syringe with water, and dust on the flowers of sulphur. Some have tried fumigation as a means of application, but not so successfully as using the powder. At a time when it was thought certain destruction awaited the vineyards in Portugal, it was seriously proposed to apply sulphur to all the vines in the country. With a view to accomplish this, and to get at the cost, the following ingenious calculation was made by Mr. Forester. The annual production of wine in the Alto Douro district is stated at 80,000 pipes, and the number of vines at 800,000,000. The operation was intended to be performed three times on every plant, and a consumption of 2 oz. sulphur on each application, which would give 480,000,000 ounces, equal to 13,392 tons for the Douro district alone, but calculated for the whole country would amount to 133,920 tons. The expense of sulphur at that time was £10 per ton, and the above quantity at this rate would cost £1,339,200. One man could moisten a vine in a minute, and another dust it in the same time, so that two men could manage 700 vines daily. Such labour, extended over all the vines in Portugal, would cost £142,850. Syringes and other implements would cost about £40,000, and a sufficient quantity of water carted and distributed over the mountain vineyards not less than £450,000, making up an aggregate of £3,190,000 sterling. Now, such an expense, in the mere endeavour to save one year's crop, would be equal to more than the whole revenue of Portugal for one complete year. I need scarcely add, that while the value of sulphur as a remedial agent continued to be recognized, its very extensive use throughout the whole of Portugal to all the vine plants was never undertaken or carried out. So successful has sulphur invariably been, that the recent promulgation of as perfect, but much more simple and less costly material for arresting this disease, was as unexpected, as the substance itself is novel. The proposal emanates, within the last few months, from P. Lazaris, of Athens, was proposed last autumn, and the result given, of what appears conclusive experiments, conducted during four successive years. M. Lazaris declares *that any substance dried and pulverized, which does not injure the foliage or fruit of the vine, cures the Oïdium.* Sulphur, he thinks, acts in exactly the same manner and exercises no specific effect; his belief being, that sulphur merely plays the part of an absorbent, and when applied dries up the juices, so to speak, of the filaments of the parasitic fungus, and thus, by cutting off its nourishment, prevents its growth or vitality."

Mr. Mackay closes his paper as follows:—

"In concluding, I may remark, that though there are still differences of opinion as to the origin and cause of the disease, I hope I have proved that the real remedy is now, and has been for some time, in the hands of the farmer, and that he can, by timely care, prevent the ravages of this destructive parasite, when it appears in his vineyard. The disease has, it is true, destroyed many vineries in this country and elsewhere, attacking plants in all stages of growth; but, notwithstanding, we find some vines, of a good old age, continuing to bear, year after year, quantity and quality of ripe, delicious fruit, as, for instance, the old tree at Hampton Court. Whatever therefore may be the cause of vine disease, there cannot but be a feeling of thankfulness and gratitude in the heart of the Continental vine-grower, as well as in that of the British merchant, that it has pleased the All-Wise Disposer of events so to check such

a dreadful scourge, by placing within the reach of man a remedy so simple and effective, that we have every reason to hope and believe the *Oïdium Tuckeri* will not again cause such fear of misery and starvation, but that, onwards, the vine may flourish as in days of old, causing the heart of man to rejoice, and carrying comfort, peace, and happiness to the domestic circles of many a family, whose daily bread depends upon the health and vigour of the beautiful vine."

ON THE ERGOT OF WHEAT.

BY M. CH. LEPERDRIEL.

In a thesis lately maintained in the College of Pharmacy at Montpellier, M. Leperdriel, junior, has proposed the employment of ergot of wheat as a substitute for ergot of rye. We subjoin a short abstract of his conclusions, derived principally from a notice of the work in 'L'Union Pharmaceutique.'

Ergot of rye, says M. Leperdriel, possesses undoubted medicinal properties, whilst at the same time its employment is attended with serious inconveniences. Many medical practitioners give it fearfully, and often exclude it altogether from their practice, on account of the serious accidents which have sometimes followed even its judicious administration, and we have seen, more than once, the Academy of Medicine censure accoucheurs and midwives for its improper employment.

There are two reasons which are opposed to the use of ergot of rye in medical practice:—thus, in the first case, it is soon injured by damp, and becomes destroyed by mites; and secondly, it contains a notable amount of a poisonous resinous principle. From these causes it necessarily follows that this remedial agent is often inert, and sometimes dangerous.

Struck by these drawbacks to the employment of ergot of rye, M. Leperdriel has endeavoured to prove that in ergot of wheat we have a remedial agent too little known, and which is a good substitute for it, as it possesses all its medicinal properties without having to the same extent its alterability or poisonous effects.

Ever since the year 1565, when Lonicer first spoke of the ergot of rye, until the present day, this substance has been the object of numerous investigations, both as regards its mode of production, and its medicinal properties. M. Leperdriel, after passing in review the long list of authors upon the subject, and making quotations from the most celebrated pharmacologists, thus sums up the views of botanists upon the production of ergots in general.

Ergot is a disease confined to glumaceous monocotyledonous plants, and more especially to those of the Grass order (*Graminaceæ*). In the latter order, ergot has been found in nearly all of its genera. From the investigations of M. Tulasne, and the general conclusions of modern botanists, it results that there are three phases or different conditions in the development of ergots: first, the *sphacelium*, the initial form of the fungus, which at an early period encroaches upon the surface of the ovary, and which after being covered with one-celled naked reproductive spores, remains in the form of corrugated and decaying *débris* upon the summit of the sclerotial state of the ergot; secondly, the *sclerotium*, a compact and hard stroma, which constitutes what is commonly known as the ergot, and which is developed under the sphacelium in the cavity of the ovary or ovule; thirdly, the *Claviceps purpurea*, the definitive state or rather the most complete fructification of the species, which is developed upon ergots placed in earth, under the form of a fungus with a cylindrical stalk, and terminated by a globular head which encloses the conceptacles, sporangia, and spores.

As regards the ergot of wheat, M. Tulasne thus speaks of it:—"Although as a general rule, ergot is rather rare in the ears of wheat, it is nevertheless not so difficult to find there as many authors would lead us to suppose. Whilst the same ear of rye will bear a number of ergots, that of wheat usually produces but one, and very rarely more than two. Caries sometimes accompanies the ergot, in which case the grains of wheat become the seat for the development of two very different parasitical fungi."

The ergot of wheat is much rarer than that of rye. It is produced more especially in wet seasons, and always on that side of the ear which is most exposed to damp.

It is impossible to confound the ergot of rye with that of wheat. The *ergot of rye* is fusiform in shape, generally curved like the spur of a cock, whence its name of spurred rye, and furrowed longitudinally with striæ of equal depth. It varies from about three-quarters of an inch to more than an inch in length; and from nearly half an inch to about three-fifths of an inch in circumference. The *ergot of wheat* preserves the form of the grain which it replaces. It is shorter and much thicker than the ergot of rye, thus it varies in length from about two-fifths to three-fifths of an inch; and from about three-quarters of an inch to nearly an inch in circumference. It is very deeply cleft and often even divided into two, or sometimes into three, at its upper extremity.

The *ergot of oat*, of which M. Leperdriel also speaks, resembles that of rye, with which it is frequently mixed; it may be easily known from its smallness and the absence of evident striæ.

There is no very perceptible difference either in the colour or odour of the ergots of rye and wheat; still the latter appears to be darker and less nauseous than that of rye. A microscopical examination shows a difference in the sporules of the two ergots.

The most remarkable physical property which the ergot of wheat possesses, is, undoubtedly, its power of resisting decay, and hence of preserving for a length of time its medical virtues. Some of it in powder, wrapped in paper, and left in a drawer, had not, at the end of a year, undergone any change; and when employed by several physicians, it acted as energetically as the fresh powder. Can the same be said of ergotized rye?

M. E. Gonod has repeated the experiments of M. Leperdriel, and has also noticed *that ergot of wheat and the powdered ergot may be preserved many years without losing their medicinal properties.* This cannot but be considered as a most interesting fact, and one of such great advantage in the use of ergot of wheat over that of rye, that it ought to secure it an important place in therapeutics.

Several practitioners and professors of the school of Montpellier have also experimented with ergot of wheat in various pharmaceutical forms, and have come to the conclusion that the action of ergot of wheat is as energetic and as rapid as the ergot of rye. They moreover all agree in stating that the ergot of wheat had never in their hands produced the slightest injurious effects, either on the mother or child.

From this thesis of M. Leperdriel's, it follows, *that ergot of wheat ought to be employed in preference to that of rye*, for these reasons:—(1) because it does not alter by keeping; (2) because it contains 15 per cent. less of the poisonous principle of ergots; and (3) because it yields 20 per cent. more of the efficacious principle.

FIR-WOOL OIL AND FIR WOOL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Feeling assured that you would not intentionally leave your readers under an erroneous impression, I beg to direct your attention to the article, headed as above, at page 376, in the last number of your valuable Journal. It states "that the fir-wool oil had been favourably mentioned by the 'Lancet,' 'Pharmaceutical Journal,' and 'L'Officine.'"

As it is a well known fact that until recently, and after the fir-wool oil had gained a reputation, the only fir wool and fir-wool oil manufactory in existence was that of M. Lairitz, who succeeded the original inventor, M. Pannewitz, the favourable mention in the medical papers could therefore have reference only to the fir-wool oil, etc., manufactured by M. Lairitz.

In your Journal, 2nd ser. vol. iii. No. 1, p. 29, Mr. Cooke, F.S.S., gives an interesting and very correct account of the fir wool and fir-wool oil in its infancy, but was under the impression that there were two manufactories of this article in existence. This error arose simply because he was not aware that M. Lairitz succeeded M. Pannewitz, the original inventor (who died shortly after his discovery), and transplanted the works to the Thüringer Forest, where pine is in abundance. Mr. Cooke closes his article with the following remarks:—

"The forest-wool-ware manufactory of Remda, in the Thüringer Forest, advertises, forest-wool oil, spirits, wadding and other articles, already enumerated." Whether

these deserve, or not, all the high encomiums that have been passed upon them, it is nevertheless an important fact that a material, before considered useless, is now converted into articles of domestic utility and commercial importance.

That the fir-wool preparations have gained a reputation on the Continent is now an established fact. M. Lairitz has received the French prize medal at the Metz Exhibition in 1861; and since their introduction into this country, they have made rapid progress, more particularly in Manchester, the seat of M. Lairitz's agency.

By inserting the above in the next number of your valuable Journal, you will oblige

Yours respectfully,

S. Beaver.

THE BOUQUET OF WINES.

BY M. STRACKE.

According to the author, the "bouquet" is due, not to the intervention of tartaric acid, as some have thought, but to the decomposition of the oil contained in the pips of the grape, under the influence of fermentation. This opinion is based on the fact that the veritable bouquet may be obtained by fermenting pure sugar with washed yeast, to which has been added an emulsion, prepared either with the pips of the grape, with nuts, or with almonds. Stearic acid dissolved in starch-paste may also be used. It is, however, essential that these oils should be in the state of emulsions, that they may freely mix with the solution of sugar. The bouquet is composed of several proximate principles of a complex nature.—*Journal de Chimie Médicale.*

COLOURING MATTERS DERIVED FROM PHENIC ACID.

BY MM. GUINON-MARNAS AND BONNET.

The authors obtain red and blue colouring-matters from this source by the following process:—They take of phenic acid, 10 parts by weight; oxalic acid, 4 to 8 parts; sulphuric acid, 3 to 6 parts. These ingredients are mixed and heated until a red colour is developed, and the mixture becomes viscous. It is then washed with boiling water to remove the excess of acid. The colouring matter thus obtained has a green colour by reflected light, resembling cantharides; one part by weight of this (to which the authors have given the name of péonine) is then mixed with two and a half parts of strong ammonia, and the mixture introduced into a metal digester, perfectly closed; heat is then applied for three hours, the temperature not exceeding 156° C. When cool, the vessel is opened, and the colouring matter is found to be dissolved in the ammonia, forming a dense red liquid, which serves directly as a dye for silk, wool, and other textile fabrics.

To make the blue colouring, to which the name of azuline is given, five parts of peonine are mixed with from six to eight parts of aniline, and the mixture heated to near its boiling-point for several hours; the result of the reaction is a blue colouring-matter, which is purified by washing with benzole and caustic alkalies; it is then washed with boiling acidulated water, and dried. It is thus obtained as a dark powder, having a golden reflection, and soluble in alcohol, methylene, etc.; these solutions serve directly for dyeing. The blue is described as magnificent. The authors hold patents in France for these discoveries, and they claim the use of several other alkaloids, as naphthylamine, toluidine, cumidine, etc., in place of aniline, and expect these to give the same transformation with peonine, with but slight modification of the colour.—*Répertoire de Chimie.*

THE NEW DEVELOPMENT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The "New Development" paper by Mr. Ince has met with a good practical reply from your correspondent Mr. B. M. Johnson; he has flung out a few "*hard facts*" which will tend to blunt the darts of our somewhat "too romantic friend."

But your Clifton correspondent, Mr. R. W. Giles, in his attempt to give

"some more practical suggestions," has simply blown over one burden, to set down another equally untenable.

Why, some of us would ask, should the Society be burdened with either the manufacture of Pharmacopœia preparations, or the exhibition of "working models" of pharmaceutical apparatus?

Is it possible that at this present moment each one is left "to flounder through his own series of failures and misfits" without the opportunity of seeing "a real working model" suitable for the ordinary operations of pharmacy. Are our engineers and published works of information grown so "old-fashioned," that they can no longer be consulted? and that therefore we must have an "*expensive*" centre of attraction to which future aspirants to this particular branch of science may be borne? We hope, surely this cannot be.

It "*may*" be true that we are become "mere chapmen" in drugs, but let us fondly hope we have not grown so "*brainless*" as to be ignorant of the operations necessary for the proper carrying out of our college instructions: dependent we must be, to some extent, upon our neighbours, and if some few "are not what they should be," all are not of the same class, and if an individual has been "badly used" once, the blame lies at his own door if he becomes a victim the second time. "A man with brains and a little ingenuity" is far more likely to find out the style of apparatus suited to his particular requirements," than would be the "unskilful" with a Bloomsbury Square full of models.

Some of us are true lovers of "progress," but not at all fond of pulling down existing contrivances without a fair probability of something "better" to stand in their place.

To destroy is an easy task, but to invent and build belongs to a different class.

Your correspondents, we submit, are "taking for granted" a "little too much;" their argumentation presupposes "great imperfection" on the one hand, and a "lack of information" (especially in regard to apparatus) on the other, which can scarcely be the "correct representation" of things; the state of pharmacy in Great Britain is, we hope, in a far more "healthy condition."

It cannot be denied that there is a great variety of preparations for which we are (and must be) dependent upon manufacturers other than ourselves; and if we can safely confide such preparations to their care and oversight, it cannot be unreasonable to suppose that they will exercise an equal amount of care over other remedial agents which our "convenience" would prompt us to apply for, and which, in this age of "express speed," we may not be able (not from ignorance) to prepare for ourselves; whilst some of us believe that preparations made on a large scale are more satisfactory than those prepared "on the small scale." We have the means within our reach of testing most of the articles submitted to us, for adulteration or impurity; and as (as we have before said) we must be dependent upon somebody, be it ours, if possible, to improve the existing machinery, rather than burden ourselves with new, for "good workmen" are sometimes baffled by "new tools."

A word or two ere we close, on the latter clause of Mr. Giles's letter. His view in reference to the future pharmaceutist is somewhat discouraging. Money has never yet possessed the magic charm of "*buying brains;*" it is very useful and very necessary, and furnishes the means of acquiring knowledge more readily and more efficiently than it could be attained without it, or with but a small share; yet we submit that there are, and may be still, establishments "with a large amount of dead capital invested," possessing at the "fountain head" but a small proportion of that "living capital" which vivifies and moves the whole.

Your correspondent says, "If the trade of pharmacy is to be carried on in a manner which admits of creditable competition with 'well-conducted' establishments, it is necessary to invest an amount of dead capital bearing a larger proportion to the saleable stock than in almost any other business."

This is a somewhat one-sided view of the subject. These "well-conducted establishments" "*have grown*" to their existing dimensions by additions and alterations which experience has suggested, and the amount of "dead capital" represented there is the result of "*accumulation*," and not of "*original worth*."

It may, we think, be safely inferred that there is less to be feared from intelligent, skilful men with "*small means*," than from ignorance with its "larger possessions;" and less fear, too, of that monopoly which would inevitably follow if the trade of pharmacy was vested in the "*moneyed*" interest, and ruled by its (too often) relentless hand.

If there is a love for the science and trade of a chemist and druggist, coupled with ingenuity and talent, we think parents and guardians cannot be far wrong in sending their youthful charge to "*culture*," even though there be an absence of somewhat large available means.

I am, Sir, yours obediently,

Cheltenham, February 10th, 1863. G. G. Hornsby.

REVIEWS.

The Journal of Botany, British and Foreign. Edited by Berthold Seemann, Ph.D., F.L.S., F.R.G.S. London: Robert Hardwicke, 192, Piccadilly. To be published Monthly, 32 pages, 8vo, with a Plate by Fitch.

We gladly call the attention of our readers to the above new Journal of Botany, the first part of which has just appeared, under the able editorship of Dr. Seemann. From the prospectus we learn that the Journal will consist of two distinct sections; the one devoted to general botany, the other to the botany of the British Isles. In both divisions original papers on subjects new to science will be given, and, when necessary, illustrated either in the text or by special plates. Original communications will of necessity relate to the different sections of the science, for which it is likely that Systematic papers will form the bulk; yet Structural, Morphological, and Physiological botany will be attended to; nor will Geographical nor Palæontological botany be neglected.

A journal which should thus embrace the various departments of botanical science has long been a desideratum to British botanists; and from personal knowledge of the comprehensive nature of the editor's studies, and of the able men who have promised him their support in the undertaking, we cannot doubt its success in a scientific point of view. We ask all, therefore, who take an interest in botanical science, to promote its pecuniary success (without which it is unreasonable to hope that it can long exist), by becoming subscribers, and recommending their friends to do the same.

A Manual of Animal Physiology, for the Use of Non-Medical Students, with an Appendix of Questions from various Examination Papers, including those for the B.A. London, for the last Ten years. By John Shea, M.D., B.A. Lond., M.R.C.S. Eng. etc. London: John Churchill and Sons, New Burlington Street. 1863.

The author, in his Preface, says that his object "in compiling the work he now submits to the public, is to present to the *non-medical* student a book by means of which the acquirement of some knowledge of physiology may be rendered comparatively easy, and to economize the time and labour of those who are compelled to prepare themselves for examination on the subject, by collecting into one volume the information they would otherwise have to obtain from various sources."

In order to make his little work available to those who are altogether ignorant of

anatomy, the author has introduced the necessary amount of anatomical description, in fact, properly speaking, the present volume should be described as a "Manual of Rudimentary Anatomy and Physiology." From a careful examination of the subject-matter of the volume, we can vouch for its general accuracy; and hence we do not hesitate to recommend its perusal and diligent study to all Pharmaceutical students, to whom we consider some knowledge of anatomy and physiology almost indispensable.

BOOKS RECEIVED.

A Systematic Handbook of Volumetric Analysis; or, the Quantitative Estimation of Chemical Substances by Measure. By Francis Sutton, F.C.S., Professor of Practical Chemistry, Norwich. London: John Churchill and Sons, New Burlington Street. 8vo, pp. 282, 1863.

TO CORRESPONDENTS.

Erythroxylon Coca.—The leaves of this plant have frequently been brought before the notice of the public. One account may be found in the June number (1860) of this Journal. There is also an original description of their use and somewhat marvellous effects in the 'Technologist,' vol. iii. No. 30; but they are probably indebted to a recent panegyric in the 'Cornhill Magazine' for an introduction into non-medical circles. The results hitherto obtained in this country have by no means realized the anticipations raised. The leaves may be had in any reasonable quantity in Covent Garden Market.

A Reader (Leeds).—The coloration of the syrup of phosphate of iron is due to some imperfection in the process of manufacture; its removal is impracticable.

A Glasgow Member.—We presume that the article sold as "liquor carbonis detergens" is intended.

Juvenis (London).—The examinations of the Pharmaceutical Society would not be available in the cases alluded to.

A Member.—Santonine Lozenges are generally made to contain 1 grain of santonine in each lozenge.

Anxious Inquirer.—(1) Blaine's 'Outlines of the Veterinary Art' (Longman), 24*s.* (2) Rymer Jones's 'Outlines of Comparative Anatomy.'

A. P. S. (Plymouth).—(1) See Professor Bentley's remarks, Pharmaceutical Journal, vol. xvi. p. 257. (2) We know of no other practical means, except excluding light.

Juvenis (Derby); and *Registered Apprentice* (Manchester).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

Butter of Antimony.—"Anti-Ph. Apprentice" is recommended to consult Pereira's 'Materia Medica,' or any other standard work, and he will find "on which side his bread is buttered."

H. C. (Ipswich).—Dr. Marshall Hall's 'Ready Method in Asphyxia' was published in the 'Lancet,' October 25th, 1856, and in other medical periodicals. Want of space this month obliges us to defer the publication of the rules to be observed in this method.

A. P. S. (Liverpool).—(1) *Silvering Powder:*—Chloride of silver 1 part, pearl-ash 3 parts, common salt 1½ part, and whiting 1 part,—applied by means of soft leather moistened with water (*Cooley*). (2) The subject is one for mutual arrangement between Principal and Assistant.

Y. Y.—The framework of the article required should be suspended in a saturated solution of alum.

An Oxonian is thanked for his communication.

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. X.—APRIL 1st, 1863.

OUR LOCAL SECRETARIES.

The country members of the Pharmaceutical Society will remember that certain resolutions were passed by the Council in 1862, somewhat altering the method of selecting local secretaries. Previously the selection had been made directly by the Council; in the last annual report it was announced that the opinion of the members residing in the district for which the secretary was to act, would in future be taken. Many of the gentlemen then holding the appointments had held them from the commencement of the Society, and it was felt that, through lapse of time, an insufficient estimate of the active duties pertaining to the office had in some cases arisen, and that a periodical renewal of it would tend to keep alive that interest which is so necessary for cordial co-operation. Whilst, on the one hand, it is important that a local secretary should possess the full confidence of the Council, it is, on the other, no less so that he should have "honour in his own country,"—indeed, without the latter he cannot well enjoy the former.

In the infancy of the Society, before the examination test superseded the original certificate of fitness for membership, local secretaries played a more important part in the Institution than they now do; but there is still good service to be done by those who take an interest in the cause, and the opportunities for doing it seem to be at this moment increasing. Provincial societies are springing up, which, if we mistake not, will contribute greatly to advance the trade generally, and strengthen our body by stimulating and assisting young men to qualify themselves for Pharmaceutical Chemists.

These societies work for the same object as we do, and desire to go hand-in-hand with us in attaining it—witness the Leeds and Nottingham associations, established within the last three months. In such cases our friends should not be backward, and our secretaries might give important aid. Careful and continuous action is required to frame and sustain these unions.

Apprentices applying to be registered most commonly reside in the country. The classical examination may be held wherever a suitable person can be found to examine; there is no need for the candidate to present himself to the Board of Examiners in London, and it is through its local secretaries that the Council can best select an examiner and delegate the office to him. From the local secretary the apprentice also should be enabled to obtain all information needed by him on this matter; that the demand for it is daily increasing, the correspondence with Mr. Bremridge amply testifies. There is nothing more important for the advancement of our cause than these registrations.

Immediate prosperity comes on the accession of members, but ultimate success depends on the enrolment of the juniors.

Of course, on appointment, each secretary would be put in possession of the Charter, Act, Bye-laws, Examiners' regulations, and other particulars of the Institution, by which he will at once comprehend the basis of the

Society's operations, the qualifications and conditions required of members, associates, and apprentices, and the privileges of which in this district he becomes the guardian; his position should render him accessible to all, and the importance of the matters committed to his care should make him the prompt and confidential correspondent of the Council on all subjects of common interest to the trade.

Seeing, then, how essential it is to have the best man in each district to represent the Council—men who will not simply be ready on application to answer a question, but who will also, unasked, embrace whatever opportunities may arise for advancing pharmacy, it is hoped our country members will respond to the call now made by the Council for assistance in these appointments.

They send up good men from all parts of the kingdom to represent them in Council, and we believe they can best judge also who will most worthily carry out in their own localities the work of the Society.

The method is simple and involves no trouble; voting papers for local secretaries (of which a copy appears in the Transactions of the Society) will this year accompany those sent out for the election of Council, and each member will have the opportunity of recording the name which appears to him most suitable.

DO THEY MANAGE THINGS BETTER ABROAD?

No one can doubt that a vast improvement has been effected in the state of pharmacy in this country during the last twenty years. Druggists, drugs, and drug-shops have alike participated in the ameliorating influences of the spirit of reform which has prevailed, and which, encouraged and sustained as it has been by the leading members of the pharmaceutical body, could not fail to affect the whole class of chemists and druggists. A few years' apprenticeship, with a minimum of school-knowledge, including a smattering of Latin, which, if not acquired at school, might be imperfectly picked up at the counter, is no longer considered sufficient to qualify the pharmaceutical student for the exercise of his intended business. The qualified pharmaceutist is now supposed to have had a good preliminary education, including Latin and arithmetic. He is expected to make Chemistry and Botany subjects of systematic study, and to apply these branches of knowledge in the further study of Materia Medica and Practical Pharmacy. The examinations established by law for testing the qualifications of candidates for the title of Pharmaceutical Chemist, comprise the subjects named, and contemplate a thorough knowledge of them. The druggist, if he conforms to this system of education, will no longer be, as he too often has been, a dealer in drugs, of the natural history and properties of which he knows little or nothing, and a self-styled Chemist, without any knowledge of chemistry. He will be qualified to take a respectable position among scientific men, and to exercise the duties of his profession with safety to the public and satisfaction to himself. Such a position has long been occupied by pharmaceutists in France, Germany, and other Continental countries, and English druggists have often been reproached for being far behind their Continental brethren in the scientific as well as practical knowlege appertaining to pharmacy.

The question, "How do they manage these things abroad?" may often lead to investigations, from which useful instruction and valuable suggestions may be derived, and this is especially the case with reference to the acquirement of pharmaceutical knowledge, and the practical application of it.

In France they have a system of pharmaceutical education, more complete,

perhaps more perfect, and certainly more general than we have in this country. The student there, before entering upon the study of pharmacy, must have previously taken a degree in Arts. Besides a term of apprenticeship, he is required to devote two or three years to systematic, scientific study, and his knowledge is tested from time to time by strict examinations. The French pharmaceutist is in these respects fully educated for his position, and no one is allowed to occupy the position without having what is considered to be the requisite qualification. Then there are strict laws against the adulteration of drugs, and for regulating generally the mode of conducting a pharmaceutical establishment, so as to secure the safety of the public. Some of these laws even aim at the suppression of quackery. They have been referred to in illustration of what has been thought to be required in this country. In commenting upon the low state of pharmaceutical knowledge and education here, and the imperfect state of our laws affecting adulteration, the sale of poisons, and the supply of patent medicines, it has not unfrequently been said, "They manage these things better in France."

Now, before we follow the French system too far, and while we are carrying out our measures for the advancement of pharmaceutical knowledge, and the improvement of the state of pharmacy and pharmaceutists in this country, let us inquire, not only as to the state of pharmaceutical knowledge among our neighbours, but also as to the existing state of pharmacy there. Has the working of the French system proved in every respect satisfactory? We believe it will be found that this is by no means the case. We had frequent opportunities at our last International Exhibition of hearing the opinions of eminent French pharmaceutists and scientific men with reference to the present state of pharmacy in their country, and in no case was their opinion a favourable one. It would appear from the statements made, and also to some extent from the character of the medicines exhibited, that French pharmacy is rapidly resolving itself into a system of quackery, in which secret or proprietary preparations are superseding the regular recognized preparations of the Pharmacopœia.

It is, we think, a very important question for us to consider—how far are we likely to fall into the same error as our neighbours, and what is it that tends to that result? That there is a tendency in this country as well as abroad, to multiply unnecessarily the number of preparations used in medicine, cannot, we think, be denied, and we have on previous occasions referred to this as a great and growing evil. The composition and mode of production of many of these medicines are known only to those who introduce them. They are nostrums in the strict sense of the word, sometimes with what appear to be scientific names, but which are often very inapplicable. In other cases the names may correctly represent the nature of the preparations, but the mode of production may be doubtful, or the preparation at any rate is redundant, and calculated only to complicate, and not to advance according to any rational system, the practice of medicine. Are we not thus tending to a system of quackery, which is calculated to produce a most injurious effect, alike upon the state of pharmacy and pharmaceutists, and upon the science of medicine?

We are not to ascribe this result to improved education, or the manner in which the qualification of Pharmaceutists is provided for. It is not the nature or amount of the knowledge possessed by our members that is at fault, but the practical application which is made of it, each individual endeavouring to establish a set of formulæ of his own, and making these a means of advertisement, instead of contributing to a common stock of knowledge, from which a general Pharmacopœia may be constructed, comprising all that is necessary, but avoiding needless complications or additions.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

FINANCIAL STATEMENT—*From 1st January, to 31st December*, 1862.

Receipts.	£.	s.	d.
Balance in Treasurer's hands	157	11	7
,, ,, Secretary's hands	2	1	11
Life Members' Fund:			
30 Life Members' fees	215	5	0
Interest	57	14	4
	272	19	4
Benevolent Fund:			
Subscriptions	45	8	0
Interest	160	19	0
	206	7	0
Government Securities:			
Interest	28	17	6
Rent	83	10	0
Fees:			
Lecture	105	10	6
Laboratory	313	6	0
Registrar—			
30 Pharmaceutical Chemists	162	15	0
34 Assistants	138	12	0
68 Apprentices	142	16	0
399 Registration Certificates	19	19	0
	464	2	0
Subscriptions:			
345 London Members	362	5	0
1464 Country Members	1537	4	0
89 Associates	46	14	6
44 Apprentices	23	2	0
	1969	5	6
Arrears of Subscription	81	7	6
	£3684	18	10

Expenditure.	£.	s.	d.
Benevolent Fund:			
Relief granted	40	0	0
Investment	279	15	4
	319	15	4
Life Members' Fund: Investment	330	15	0
Conversazione	61	16	2
Pharmaceutical Meetings	4	17	5
Sundries	5	15	8
Repayments of Subscriptions in excess	3	13	6
House Expenses	27	1	3½
Rent, Rates, Taxes, and Insurance	444	7	8
Alterations and Repairs	47	19	4
Fixtures and Fittings	72	6	4
Apparatus	58	1	8
Library (including £61, New Cases)	109	8	6
Museum	22	7	6
Furniture	18	16	1
Stationery	8	11	10
Postage	57	5	3
Printing and Engraving	65	16	6
Advertisements	33	12	4
Journals, Postage of, etc.	173	13	4
Carriage	2	17	7
Collector's Commission	25	2	3
Travelling Expenses	126	13	0
Salary to Secretary	250	0	0
Wages	159	2	6
Expenses of Society in Scotland	64	14	4
Board of Examiners	58	16	0
Professor of Chemistry and Pharmacy, including duties as Curator, and payment of Assistant	300	0	0
Professor of Botany and Materia Medica, including duties as Curator, and payment of Assistant	250	0	0
Special Evening Lectures	21	0	0
Subscription to Royal Botanic Gardens	21	0	0
Prize Medals, etc.	4	16	6
Laboratory:			
Director's Salary	50	0	0
Demonstrator	25	0	0
Porter's Wages	11	14	0
Expenditure (materials)	67	15	10½
	154	9	10½
Law Costs	94	4	8
Balance in Secretary's hands	2	4	9
Balance in Treasurer's hands	283	16	8
	£3684	18	10

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement, and that, as shown by the Books of the Society, there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1862:—

On Account of the General Fund, New 3 per Cents....	£1000	0	0
Benevolent Fund, 3 per Cent. Consols.....	5875	8	7
Life Members' Fund, 3 per Cent. Consols	2355	2	5

EDWARD CONSTANCE,
WILLIAM M'CULLOCH,
JOSEPH THOMAS PRESTON,
JOHN CARR,
} *Auditors.*

26th February, 1863.

AT A MEETING OF THE COUNCIL, *4th March*, 1863,

Present—Messrs. Bird, Bottle, Bucklee, Davenport, J. B. Edwards, Evans, Hanbury, Haselden, Herring, Hills, Leseher, Mackay, Meggeson, Morson, Sandford, Savage, Squire, and Waugh,—the following were elected

MEMBERS.

ANDOVER.....Madgwick, William Butler.
LIVERPOOL.....Delf, Frederick Daniel.

Resolved—"That a Bronze Council Medal for Practical Chemistry be offered for Competition at the close of each Session among the Laboratory Students, and that Certificates be given to those who shall have attended for periods of not less than three months."

Resolved—"That copies of the article on the "Methylated Spirit question," which appeared in the February number of the Journal, be sent to the Public Hospitals and Dispensaries in London and the Provinces."

The following form of Voting Paper, and mode of proceeding for the future election of Local Secretaries, was adopted:—

Voting Paper for the Election of LOCAL SECRETARY for the ensuing year for the Town or District in which the Voter resides.

To be filled up (*but not signed*) and returned in the Envelope containing the Voting Paper for the COUNCIL sent herewith.

*Name and Town in which the Voter resides*_____

*Name of County in which the Voter resides*_____

*Name and Address of the Member proposed as Local Secretary*_____

N.B.—These Voting Papers will be examined by the Scrutineers appointed at the ensuing Annual General Meeting (20th May), who will report thereon to the Council.

BENEVOLENT FUND.

The sum of £25 was granted to an infirm and distressed member of the Society.

The following contributions in aid of this Fund, amounting to £120. 5*s.* were announced as having been received during the month of February.

DONATION.

Moserop, Edward H., 140, Strand.....£100

SUBSCRIPTIONS.

	£.	*s.*	*d.*
Allchin, Alfred, Richmond Rd. Barnsbury Park	0	5	0
Bird, William L., 42, Castle St. Oxford Street	0	10	6
Bottle, Alexander, Dover	1	1	0
Butler, Samuel, Bristol	0	10	0
Brown, William Scott, Manchester	1	1	0
Balmer, John, 94, St. John St. Road	1	1	0
Cartwright, William, Newcastle-under-Lyne	0	10	6
Coles, John, Camberwell	0	10	6
Davies, Charles, Brixton	0	5	0
Davies, Henry E., 43, Wood St., City	0	10	6

	£	s.	d.
Deane, Henry, Clapham	1	1	0
Eddy, Charles W., 30, Crown St., Finsbury	1	1	0
Goodbarne, Thomas, 13, Charles Street, Hoxton	0	10	0
Goodwin, John, Lower Clapton	0	10	6
Gristock, Thomas, 42, South St., Manchester Square	0	10	6
Howell, Thomas, Camden Town	0	10	0
Johnson, Benjamin M., 70, Tottenham Court Road	0	5	0
Linsley, Thomas, York	0	5	0
May, John, Battersea	0	10	6
Moore, James L., 1, Craven St., Westbourne Terrace	0	10	6
Nichol, Anthony, Newcastle-on-Tyne	2	2	0
Orridge, Benjamin M., 30, Bucklersbury	1	0	0
Penrose, Arthur W., 7, Amwell Street, Clerkenwell	0	5	0
Robinson, Jas. Mowld, Beverley	0	5	0
Savage, William D., Brighton	0	10	6
Shirley, John Geo., Bayswater	0	10	6
Sims, John F., Barnsbury	0	5	0
Seott, William, Sowerby Bridge	0	5	0
Spencer, Charles, Gravesend	1	1	0
Warner, Charles H., Fore St., City	1	1	0
White, Daniel, Park Terrace, Regent's Park	1	1	0

BOTANICAL PRIZE FOR 1864.

A SILVER COUNCIL MEDAL

Is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1863, and the first day of July, 1864; and should there be more than one collection possessing such an amount of merit as to entitle the collectors to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing such an amount of merit as to warrant the Council in awarding Medals or Certificates, none will be given.

The collections to consist of Phanerogamous Plants and Ferns, arranged according to the Natural System of De Candolle, or any other natural method in common use, and to be accompanied by lists, arranged according to the same method, with the species numbered.

The collector to follow some work on British Botany (such as that of Babington, Bentham, or Hooker and Arnott), and to state the work which he adopts. The name of each plant, its habitat, and the date of collection, to be stated on the paper on which it is preserved.

Each collection to be accompanied by a note, containing a declaration, signed by the collector, and certified by his employer, or a Pharmaceutical Chemist known to the collector, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1863, and the first day of July, 1864, and were named and arranged without any assistance but that derived from books.

In estimating the merits of the collections, not only will the number of species be taken into account, but also their rarity or otherwise, and the manner in which they are preserved; and should a specimen be wrongly named, it will at once be erased from the list.

The collections to be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of August, 1864, indorsed "Herbarium for Competition for the Botanical Prizes."

If required, the collection will be returned after competition.

No candidate will be allowed to compete unless he be an Associate, Registered Apprentice, or Student of the Society, or if his age exceed twenty-one years.

FREE ADMISSION TO THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

The following pupils of the Class of Materia Medica and Botany, in the Pharmaceutical Society, after examination in the Elements of Structural and Physiological Botany, were recommended by Professor Bentley to Mr. Sowerby, the Secretary of the Royal Botanic Society, for free admission to the Gardens in the Regent's Park, and the privilege was at once liberally accorded to them:—

Mr. C. Allcock
— P. Bond
— Th. Borchert
— J. Bourdas
— G. Brown
— M. Carty
— W. Fleeming
Mr. E. B. Goulden
— L. Hooper
— T. Kerfoot
— H. A. Peele
— W. Y. Scruby
— P. W. Squire
— C. Umney

The above are arranged alphabetically, and without any reference to actual merit exhibited at the examination.

These orders will admit the above Students to the gardens upon ordinary days in the months of March, April, and August, from nine A.M. till one P.M.; and in May, June, and July, from seven A.M. till one P.M. Such orders, therefore, give every facility to those who possess them of making themselves practically acquainted with plants.

PHARMACEUTICAL MEETING.

Wednesday, March 4, 1863.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to their respective donors:—

The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.
The Photographic Journal.
The Technologist.
The Educational Times.
Répertoire de Chimie. All the above from their respective Editors.
The Journal of the Chemical Society.
The Journal of the Society of Arts. From the respective Societies.
Transactions and Thirteenth Annual Report of the Liverpool Chemists' Association. From the Association.
On the Cascarilla Plants of the West India and Bahama Islands. By W. F. Daniell, M.D. From the Author.
An Almanack of the Stationers' Company. Date 1720. From Mr. J. Slipper.
Dried rhizomes and rootlets of *Veratrum viride.* From Dr. Ephraim Cutter, America.

The following Papers were read :—

ADDITIONAL OBSERVATIONS ON STORAX.

BY DANIEL HANBURY, F.L.S.

When I had the honour of laying before the Pharmaceutical Society some observations on Storax,* I hoped to be able to communicate at no distant interval such additional information as would complete the history of that drug. During the six years that have since elapsed, I have not lost sight of the subject, and although I am still unable to determine all the points I wished to clear up, I am induced by reasons which I will presently explain, again to bring it before the Society.

To render my remarks more intelligible, I will briefly recapitulate the conclusions which my former paper was intended to establish and which are the following :—

1. That the storax of ancient times was produced by *Styrax officinale* L.
2. That this substance has disappeared from the commerce of modern days.
3. That the resin called *Liquid Storax* is produced by *Liquidambar orientale* Mill., a tree indigenous to the south-west of Asia Minor, where the drug is collected.

These conclusions I had reason to believe were generally accepted until I received a few weeks ago a pamphlet by Professor Stamatios D. Krinos of Athens, which somewhat disputes their correctness. In vindicating my own opinions however I wish to draw attention to the new facts put forth in the learned essay of the Greek Professor of Pharmacology and to couple with them some additional information on Storax of which I have become possessed.

Professor Krinos, whose pamphlet entitled Περὶ Στύρακος διατριβὴ φαρμακογραφικὴ (*A Pharmacographical Esssay on Storax*),† is in modern Greek,‡ commences by stating that he will endeavour to show :

1. That *Liquid Storax* was known to the ancient Greek physicians.
2. The reasons why he presumes that the text of Dioscorides requires a slight change.
3. That the *Solid Storax* of ancient authors was not the produce of *Styrax officinale* L., but of the tree called in modern Greek Ζυγία and by botanists *Liquidambar orientale*, namely the same tree as that from the bark of which *Liquid Storax* is obtained by decoction and expression.

In support of the first proposition Dr. Krinos gives an elaborate review of the ancient accounts of storax, from which, but especially from the statements of the later Greek writers he draws the conclusion that Liquid Storax was a drug with which they were acquainted. In the works of Paulus Ægineta, he observes, we first find mentioned, besides solid storax, a second kind *liquid storax* and also the resin of the tree Ζυγία, which is the same thing as Liquid Storax. Aetius, who lived in the sixth century is cited as mentioning a *liquid storax ;* and also a spurious treatise of Galen, the writer of which referring to the resin of ζυγία, explains that it is synonymous with Liquid Storax. The Arab authors are then reviewed, and subsequently the pharmacologists of the last and present century. The learned author then points out that the word ζυγία properly signifying *maple*, is now applied in the south-west of Asia Minor to

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* Pharm. Journ. vol. xvi. p. 417.

† Εν Αθηναις, 1862, 8vo, p. 27.

‡ I am indebted to the kindness of D. P. Scaramanga, Esq., for translating the pamphlet.

Liquidambar orientale, a tree which *resembles* a maple or a plane. He also states that about the year 1841, he proved that Liquid Storax was obtained from this tree, and that an account of this fact was published at the time in the *Melissa*, an Athens newspaper.

The second proposition of Professor Krinos is that the text of Dioscorides is incorrect. Dioscorides states that the storax-tree resembles the quince, which is certainly the case if *Styrax officinale* is intended, but by no means so if *Liquidambar orientale*.* But Professor Krinos holds that the Storax (solid and liquid) of ancient authors is *not* the produce of *Styrax* at all: hence the difficulty of admitting the statement of Dioscorides, and the extraordinary proposal of *altering the text* so as to cause that author to say that the tree resembles not a *quince* but a *maple*. In reply to this I may remark that it would be needful to alter Pliny also, and that such a mode of disposing of the difficulty, unless supported by some obvious ambiguities in the early MSS. of these ancient authors, is surely inadmissible.

The third proposition that the solid storax of the ancients was derived from *Liquidambar* and not from *Styrax* is one from which I entirely dissent; still I am free to admit that a solid resin derived from the former tree *may* have passed as *Storax* in ancient times though I am entirely unacquainted with such a substance. Professor Krinos assumes that as no resin produced by *Styrax officinale* now finds its way into commerce, it is impossible to believe that that tree ever really yielded any. In this I do not concur: I have already shown that two respectable authors of the last century, Duhamel and the Abbé Mazéas actually collected storax from this tree, the one in Provence, the other in the neighbourhood of Rome. I have also ascertained within the last few weeks from Dr. Kotschy of Vienna, that in the neighbourhood of Alexandretta, the *Styrax*, which there grows to a tree, still yields its odorous resin. On the other hand I am bound to acknowledge that the endeavours I have hitherto used to obtain the resin from trees in the south of France, Asia Minor and Syria have not been successful. In Syria it is now rare to find the Styrax forming anything better than a large bush, owing to the practice of cutting it periodically for fuel, and though I have myself examined many such bushes I have failed to find upon their stems any exudation. I believe however that where the Styrax attains the dimensions of a tree, better results will be obtained and the correctness of the ancient accounts will be fully vindicated. Not only does the statement of Dioscorides that the Storax-tree *resembles a quince* indicate that he could not possibly have had the Liquidambar in view, but moreover the allusion made by him, and especially by Pliny to localities in Syria where Styrax trees, but not Liquidambar are still found, lend some weight to the argument. The geographical distribution of *Liquidambar orientale* is very restricted, in which respect it differs from *Styrax*. In the extreme south-west of Asia Minor it is gregarious, forming forests of trees of from 20 to 60 feet in height. Dr. Kotschy informs me that he has reason to believe it occurs at Narkislik, a village near Alexandretta and also on the Orontes. He also tells me that six fine old trees, *certainly planted*, exist at the convent of Antiphoniti on the north coast of Cyprus, but that there are no others in the vicinity: that the tree is there called ξύλον τοῦ Ἐφέντη (Governor's wood) and that it and the bark are used as incense in the churches. He adds that there are two trees of the same kind at the convent of Neophiti near Papho, but no others on the island. Professor Krinos states that the Liquidambar is common in Syria, a fact which is not borne out by the researches of botanists who have visited that country,† not one of whom has noticed its occurrence.

* In modern Greek, the Storax-tree is called Ἀγρία Κυδωνιά, i.e. *Wild Quince*.

† As Boissier, Gaillardot, Blanche, Roth, Bove, Michon, De Saulcy, Lynch, Erdel, Ehrenberg, Hooker, etc.

For these reasons, I am not prepared to renounce the opinion that the storax-tree of Dioscorides and other ancient writers was the *Styrax officinale* of modern botanists, nor can I abandon the idea that, like its congener *S. Benzoïn*, it is capable of yielding an aromatic resin, which was once obtained in sufficient abundance to form an article of trade.

Before quitting the subject of Storax, I think it desirable to offer a few observations on some of the substances that are known in pharmacy under that name, and first we will take *Styrax calamita*.

This drug as found in English commerce is so singularly variable that it would be difficult to suppose it a natural product. At Trieste where certainly some of it is manufactured, it is prepared (as I have ascertained on the spot) by mixing the residual liquidambar bark called *Cortex Thymiamatis*, reduced to coarse powder, with Liquid Storax. Such a mixture I have prepared myself and can assert that it constitutes excellent "*Styrax calamita*." When first mixed (in the proportion of 3 to 2), it forms a somewhat moist and clammy mass, which in the course of a few weeks developes an infinity of minute silky crystals, giving the whole an appearance of mouldiness. If the bark is scarce, common sawdust, I am informed, is substituted for it; and olibanum, red earth and honey are also employed in producing *Styrax calamita* of inferior quality. The drug is said to be manufactured also at Venice and Marseilles.

According to Professor Krinos, the Greek monks, particularly those of the island of Symi, prepare by mixing olibanum with Liquid Storax certain resinous cakes which they sell for incense under the name of ψευδομοσχολίβανον or στουράκι. It is a compound of this sort that, in my opinion, constitutes the *Black Storax* described by Guibourt, Pereira and others, and not unfrequently found in continental drug warehouses. In fact I have more than once prepared such a mixture, which is remarkably fragrant and quite devoid of the coal-tar-like odour of Liquid Storax; an efflorescence of cinnamic acid generally developes itself on the surface of he mass. It is also this substance which appears to constitute the precious incense used at Easter in the Church of the Holy Sepulchre at Jerusalem and of which small pieces are sold to the pilgrims at an enormous price,—not indeed for burning, but chiefly to be carried as a charm.

In conclusion I wish to express an earnest desire that any traveller visiting Asia Minor or Northern Syria, or resident in either of those countries would carefully examine the stems of *Styrax officinale* with a view to discover any adherent resin,—still more that he would perforate the trunk of that tree and observe after the lapse of some time whether such perforation is followed by an exudation of resin.

The PRESIDENT inquired of Mr. Hanbury the age and size to which the *Styrax officinale* now commonly attained. He was induced to do so from having noticed that some substances yielded by plants could only be obtained from them when these had arrived at a great age. Thus the Ivy, when of a considerable age and size, produced a kind of gum, with a peculiar aromatic odour, but this gum was never observed on the Ivy under other conditions and circumstances, and was a rare product. He had found on some fine old Ivy-trees at Conway Castle, on one occasion, about half an ounce of the gum.

Mr. HANBURY stated that he had no doubt the absence of solid storax at the present time arose from the cause just alluded to by the President, namely, the rarity of old and large trees of *Styrax officinale;* for although the Styrax-tree was widely distributed, being found in Syria, the Levant, southern France, and some of the other warmer parts of Europe, in very few spots was it to be found of any great size and age. In Syria this was easily accounted for, from

the scarcity of wood generally, and all trees therefore which could be cut down by the rude tools which the inhabitants possessed, were used for fuel.

Professor Bentley said that the conclusions come to by Mr. Hanbury in his papers, were commonly so well substantiated, and arrived at only after so much consideration, that he should require very conclusive evidence to the contrary before he ventured to call his results in question. On the present occasion it did not appear to him that Professor Krinos had brought forward any satisfactory reasons in support of his statement that the text of Dioscorides was incorrect. Perhaps Mr. Hanbury, who had carefully read his pamphlet, could state what substantial reasons Professor Krinos had adduced. The ancients, Professor Bentley said, were good observers of natural objects, if not botanists, and it seemed to him quite clear that when Dioscorides stated that the storax-tree *resembled the Quince*, he did not mean that it *resembled the Maple*.

Mr. Hanbury could not find in Professor Krinos's pamphlet any reasons adduced for the alteration of the text of Dioscorides which would be at all satisfactory to a classical scholar. Professor Krinos appeared to have come to the conclusion that the tree yielding the solid storax of the ancients, was like the maple, and therefore the easiest way of overcoming the difficulty of the text of Dioscorides was to alter it. Every author of importance had stated the storax-tree to be like the quince, and consequently to oppose this view without good grounds seemed altogether unwarrantable.

Professor Bentley was glad to hear from Mr. Hanbury that *Styrax calamita* was really, so far as he knew, made up of liquidambar bark and liquid storax. It was consequently a genuine drug, in which the liquid storax and the bark, which had been separated from each other, were again united. *Styrax calamita* was, however, such a variable substance, that he (Professor Bentley) could not doubt but that it was sometimes compounded in other ways. Professor Bentley remarked, that the only point necessary to prove to demonstration Mr. Hanbury's conclusions as to the origin of the solid storax of the ancients, was to find the storax *in situ*, on the *Styrax officinale*. It did seem to him somewhat remarkable, considering the wide distribution of this plant, that some trees should not exist of sufficient size and age to secrete solid storax. In Syria, as Mr. Hanbury had stated, the absence of trees of any great size was accounted for, but this did not satisfactorily explain the absence of such a secretion from other districts, where some large and old trees must surely exist. He had but little doubt, therefore, having full confidence in Mr. Hanbury's conclusions as to the origin of solid storax, that in course of time some would be found *in situ*. In order that the secretions should be formed, it was necessary, Professor Bentley said, that the plant should be found growing in a situation which was perfectly natural to it, that is, where every condition favourable to its development was present.

NOTE ON MR. MARKHAM'S *TRAVELS IN PERU AND INDIA*.

BY DR. J. E. DE VRY, HON. MEM. OF THE PHARMACEUTICAL SOCIETY.

Mr. Clements R. Markham has recently published a book entitled *Travels in Peru and India, while superintending the collection of Chinchona plants and seeds in South America and their introduction into India* (London, 1862, 8vo), which is, I am sorry to say, not in my possession, so that I am only acquainted with a few extracts from it communicated by one of my scientific friends in Europe. In the account given in this work of the culture of the Cinchona in Java, a statement is made which so seriously impugns the accuracy of my observations that I feel compelled to draw attention to it. The

statement of Mr. Markham (who I believe has made no special study of chemistry) relates to the richness or poverty in alkaloids of the *Cinchona Pahudiana* of Howard, a species of which the plantations in this island contain large numbers. On this subject Mr. Markham writes:

"It is possible that Dr. De Vry in his earnest desire to discover quinine in a species upon which so much labour and anxiety, and such vast sums of money had been expended, may have been deceived by appearances."

Now every one who is acquainted with practical chemistry knows that it is possible that a chemist may overlook quinine in a bark, if the quantity of the alkaloid be very small: but if he asserts *that he has found quinine*, his statement, provided he is a man of probity and credit, ought to be accepted, since few alkaloids are distinguished by more delicate reactions than quinine and quinidine. For my own part, after thirty years occupied in practical chemistry and with no impeachment of my good faith, I feel entitled to appeal to the sense of justice of my fellow-labourers in England not to allow my positive statement to be set aside by the mere supposition put forward by Mr. Markham.

There are other observations in Mr. Markham's work on which I would willingly offer some remarks, but as I have not access to the work itself, I will delay doing so until my return to Europe, after a visit which I purpose paying to the Cinchona plantations of British India. For the present, I will conclude with observing that if the culture of the Cinchona in British India succeed, as I hope it will, Mr. Markham must be content with a *share* of the credit, for the plants of *C. Calisaya* which he brought from Peru to India having nearly all died, the late Lord Canning requested the assistance of the Dutch Indian Government, which immediately presented the British Government with a supply of healthy plants among which were 106 of *C. Calisaya* grown from Java-seeds. These plants were carried to British India under the scientific care of Dr. Anderson and arrived there in good health with the exception of only one which died on the way. As regards the multiplication of the Cinchona by layers, I may add that experience in Java has shown that plants raised from seeds are much superior in vigour.

Bandong, Java, Jan. 8., 1863.

The President asked Mr. Hanbury if he knew in what state our Cinchona plantations in India were at the present time?

A discussion then took place, in which Mr. Hanbury, Professor Bentley, and Mr. Giles, of Clifton, took part, when it was stated that according to the latest accounts from India, it appeared that there were about 120,000 Cinchonas now on the Neilgherry hills alone, amongst which there were upwards of 45,000 plants of *Cinchona succirubra*, the species yielding the red bark of commerce, and about 1500 of *Cinchona Calisaya*. Some thousand plants of species of Cinchona had been also planted out in other parts of India. The largest of these plants was seven feet high.

We might consider the Cinchonas now well established in India, for which result we were greatly indebted to the energy of Mr. Clements R. Markham.

Since the Meeting the following letter has been received by the President from Mr. Markham:—

TO THE PRESIDENT OF THE PHARMACEUTICAL SOCIETY.

My dear Sir,—I was very sorry that an engagement prevented me from being at the Pharmaceutical Society last night: as I should have been glad to have heard Dr. de Vry's paper, and to have expressed my regret that he

should have felt annoyance at any passage in my book. Nothing could have been further from my intention than to have caused such annoyance.

The passage to which Dr. de Vry refers will be found at page 57, as follows :—

"It is possible that Dr. de Vry, in his earnest desire to discover quinine in a species upon which so much labour and anxiety, and such vast sums of money had been expended, may have been deceived by appearances. Both from the form of the capsules, the absence of quinine in the upper bark, and the locality whence it was procured, there is every reason to fear that the *C. Pahudiana* is a worthless kind. In all valuable species there is a good percentage of alkaloids in the upper bark, and a very much smaller proportion, which too is amorphous and of little commercial value, in the bark of the roots.

"This law of nature, the existence of which is proved by all experience, would have to be reversed in order to enable the Dutch to extract large supplies of quinine from the roots of species such as *C. Pahudiana*, which contains none in the upper bark.

"So great are the difficulties of this most important undertaking that, in spite of the comparative failure in Java, the highest praise and admiration are due both to M. Hasskarl and to his successors. They have devoted great ability, no ordinary amount of scientific knowledge, and untiring perseverance to this good work ; and, now that they have received plants of really valuable species from India, there is a prospect that the Chinchona cultivation in Java may eventually attain such a measure of success as will entitle Dr. Junghuhn and Dr. de Vry to the gratitude of their countrymen."

This extract will show that I have never entertained other than kindly feelings towards the experiment in Java ; but I confess that I had then, and still have, very strong doubts as to the advisability of continuing the cultivation of the *C. Pahudiana*. These doubts have not been lessened by a letter of M. Hasskarl, which I read in the twenty-first number of the 'Flora of Ratisbon,' stating that a tree of *C. Pahudiana* has been chemically analysed by Professors G. F. Mülder and F. A. W. Miquel; and that, in consequence of the joint report of these gentlemen, the Government have determined to put an entire stop to its further cultivation.

I should very much regret having unintentionally caused any annoyance to Dr. de Vry, and no one will more sincerely rejoice than I shall, at the complete success of the *Chinchona* experiment in Java.* In my opinion this end would best be attained by cultivating the species which are universally acknowledged to be most valuable, and abandoning the *C. Pahudiana ;* but at the same time I shall be glad to hear that my opinion respecting the latter species has been proved to be incorrect.

There is much to be learnt which practice only can teach ; and it is surely better for us all to recognize this fact, and not to allow such difference of opinion as we may feel respecting a prospect as yet uncertain, to interfere with courteous communication of sentiment, and co-operation as far as possible.

I am, Sir, your obedient servant,

CLEMENTS R. MARKHAM.

21, *Eccleston Square, S.W., March 5th*, 1863.

ERGOT OF WHEAT.

PROFESSOR BENTLEY wished to direct the attention of the Meeting to a thesis on Ergot of Wheat, which had been lately published by M. Leperdriel, of Montpellier, a brief abstract of which he had translated for the Pharma-

* Our readers will notice that Mr. Markham uses the term *Chinchona* instead of the more common, and till lately the one universally accepted, namely, *Cinchona*. Mr. Markham, and other authors, as Mr. Howard, who adopt the former mode of spelling, maintain that it is the correct form, as the genus was named after the Countess of Chinchon.—ED. PH. J.

ceutical Journal, and which appeared in the number for the present month (March). M. Leperdriel stated that there were two reasons opposed to the employment of *ergot of rye* in medical practice:—the first, because it was soon injured by damp, and then became destroyed by acari; and secondly, from its containing a notable amount of a poisonous resinous principle. From these causes it necessarily followed that ergot of rye was frequently inert, and sometimes dangerous. M. Leperdriel, struck by these drawbacks to the use of ergot of rye, had called attention to the *ergot of wheat*, and had endeavoured to prove that in it we had a good substitute for ergot of rye, as it possessed all its medicinal properties without having, to the like extent, its alterability or poisonous effects.*

Professor Bentley said, that without wishing to indorse all the statements made by M. Leperdriel, some of which were certainly open to criticism, still he thought that the medical profession would do well to test the effects of ergot of wheat in this country. Some years since it had been tried with success in North America, and it seemed extremely probable that the ergot of all the grasses would be found to have somewhat analogous properties. Professor Bentley added, however, that his principal reason for introducing the subject to the notice of the pharmaceutist, was to call attention to the less alterability of ergot of wheat. In this particular he could corroborate to some extent the statement of M. Leperdriel, for in the Pharmaceutical Society's Museum were specimens of both ergot of rye and ergot of wheat, which had come into the possession of the Society at the decease of Dr. Pereira. These had been both preserved in closely-stoppered bottles, and had otherwise been exposed to precisely the same influences for more than ten years; and, as might be observed by all present from the specimens now on the table, the ergot of rye was completely destroyed, while the ergot of wheat did not appear to have experienced the slightest alteration. Professor Bentley said he should like to know the opinion of the members present as to the best means of preserving ergot of rye, as if any satisfactory plan could be adduced for its preservation without loss of its remedial properties, it would probably be found more beneficial to continue its use, as it was, so far as he knew, much more readily procurable than ergot of wheat. Professor Bentley then read a letter from Mr. Smith, of Kilmarnock, in which it was stated that ergot of rye kept best when placed in paper in a dry place, as on a mantelpiece, over a fire which was daily lighted in winter.

The President said that if ergot of rye was put away in the condition in which it was received, when it was always somewhat damp, it soon became attacked by acari, and perished. He thought that if well pulverized and perfectly dried, it might keep for some time in a warm and dry place; but he had found the best plan was to keep it in a bottle with a piece of camphor.

A discussion then took place, in which Dr. Redwood, Mr. Hills, and Mr. Giles took part, from which it appeared that ergot of rye, if well dried, might be kept either exposed to the air, or in hermetically sealed bottles, or in stoppered bottles with a nick in the side of the stopper.

Mr. Long, referring to the irregular introduction of some subjects at recent meetings, thought it was very desirable that no matter should be brought before the notice of a Pharmaceutical Meeting without previous notice of the same having been given.

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* Pharm. Journ. vol. iv. 2nd ser. March, 1863, p. 423.

PHARMACEUTICAL MEETING, EDINBURGH.

The Third Meeting of the present session was held in St. George's Hall, George Street, on Thursday evening, at 9 o'clock; Mr. AITKEN, President, in the chair.

There was a good attendance. Dr. Murray Thomson, F.R.S.E., read a paper on Mr. Dale's new method for the manufacture of oxalic acid.

Although oxalic acid is not a substance having extensive application in pharmacy, yet it has so many popular uses that, independent of its most important employment in calico printing, it could not well be absent from the shelves of the pharmaceutical chemist.

The great Swedish chemist of the last century, Scheele, has some claim to be regarded as the discoverer of this acid, although one of its salts, the oxalate of potash, was well known to Duclos, who described it in the Memoirs of the French Academy for 1668, more than a hundred years before the time of Scheele. This latter chemist prepared the acid from the salt of sorrel, which is a mixture of binoxalate and quadroxalate of potass. This mixture of salts is naturally contained in the juice of more than one member of the Natural Order *Oxalidaceæ*, but especially in the common Wood Sorrel, *Oxalis Acetosella*. It is also contained in the juice of the *Rumex acetosa*. From both of these plants the acid was at one time prepared, and in comparatively late times it was made on the large scale from the latter plant in Swabia. In the form of oxalate of lime this acid also occurs as a product of the animal organism, being found as a concretion in the urinary bladder and in the urine itself, sometimes in health, but oftener in some forms of dyspepsia.

Bergmann was the first who showed that the acid could be formed artificially by the action of nitric acid on sugar. This method of producing oxalic acid very soon supplanted that of obtaining it from either the common or wood sorrel, and since Bergmann's time the process has undergone many modifications, all tending to lessen the expense of materials used, and increasing the oxalic acid produced; and accordingly, pure and raw sugar, treacle, have been employed as well as sugar extemporaneously prepared by boiling potato and horse-chestnut starch in dilute sulphuric acid. The favourite raw material however has been treacle. Plans also for saving the nitric acid have been numerous; for instance, M'Dougal and Rawson patented a process in which it was proposed to use the waste vapour of nitric acid evolved in the preparation of that acid. But the method which seems to have been generally used before the introduction of Dale's process was the following:—"Earthenware jars, of about two gallons capacity, were charged with nitric acid of sp. gr. 1·200 to 1·270,* and treacle added in the proportion of about a fifth or sixth the weight of the acid. The jars were then heated in water-baths heated with coils of steampipe, vessels of lead, or wooden vessels lined with lead, were often used instead of the jars. During the process fumes of nitric oxide were abundantly given off, when this ceased, the liquor on evaporation yielded crystals of the oxalic acid, which now only needed purification to fit them for the market.

When the acid was wished quite pure at one operation, Schlesinger's method could be adopted. This consisted in heating one part of dry loaf-sugar in eight and a quarter parts of nitric acid of sp. gr. 1·380; by this it is somewhat erroneously stated in chemical text-books only half the weight of sugar in the form of oxalic acid was obtained; but this result must have ensued from superheating, as manufacturers using the water-bath as a source of heat have obtained as much as 125 lbs. of acid from 100 of sugar, and 105 of acid from 100 of treacle.

The loss in formerly stated results was due to part of the oxalic acid being decomposed into carbonic acid gas. When the process goes on properly, no carbonic acid, or very little, is evolved; the reaction is then as follows:—

$$\underbrace{C_{12}H_{11}O_{11}}_{\text{1 eq. cane sugar.}} + \underbrace{6HONO_5}_{\text{6 eq. hydrate nitric acid.}} = \underbrace{5HO}_{\text{5 eq. water.}} + \underbrace{6NO_2}_{\text{6 eq. nitric oxide.}} + \underbrace{6C_2O_3\,2HO}_{\text{6 eq. oxalic acid.}}.$$

* A little sulphuric acid added to the nitric was said to increase the yield of oxalic.

Perhaps this explanation may not be so simple, as it is known that a fragrant odour is given off during the process, indicating that small quantities of other products may also be formed.

The process now described was the one in use for preparing oxalic acid on the large scale, previous to Mr. Dale, of Messrs. Roberts, Dale, and Co., of the Cornbrook Chemical Works, near Manchester, inventing his method of making oxalic acid by acting on sawdust with an alkali. This idea, however, was not quite new on the part of Mr. Dale, as in 1829, M. Gay-Lussac published a memoir,* in which he announced that M. Vauquelin had converted pectic acid into oxalic acid, by heating the former along with caustic potass in a crucible. M. Gay-Lussac followed up this discovery by a number of experiments, in which he demonstrated that when a number of substances were treated with potass they yielded oxalic acid. Among the substances he tried were cotton, sugar, starch, and gum. Any of them, when heated with caustic potass or soda, gave off hydrogen gas while the mixture charred; and at length oxalate of potass or soda was found in the black residue, and could easily be dissolved out of it.

Gay-Lussac also tried a number of the vegetable acids, and showed that these might be converted into oxalic acid without charring of the mixture ensuing, and on that circumstance he tried to form an explanation of the process.

But although the memoir of Gay-Lussac had been published for twenty years, no one had proposed using it as a source of oxalic acid on the large scale until Mr. Dale did two or three years ago. And although Gay-Lussac was the first to broach this method of making oxalic acid, it must not be thought that his memoir showed a way by which this result might be obtained free of obstacles; for Mr. Dale found that there were more than one practical difficulty to be overcome before he reached a successful issue. One of the chief of these was that Mr. Dale did not find that sawdust, when heated with caustic soda, was converted into oxalate of soda, as Gay-Lussac would imply. He says that soda or potass may be used indifferently, but Mr. Dale found that with soda sawdust yielded almost no oxalic acid; while, on the other hand, he was precluded from using potass on the large scale on account of its high price, though he was quite successful when he used it. At last this difficulty was overcome by using a mixture of soda and potass, in the proportion of two equivalents of the former to one of the latter, and this, it was found, was as effective as potass alone. The practical details of the process are as follows:—

1. The alkalies, mixed in the above proportion, are dissolved, and solution evaporated until of specific gravity 1·35; sawdust is now stirred in until a thick paste results.

2. This paste is then heated on iron plates, during which it is constantly stirred, water is first given off, the mass then swells, inflammable gases, hydrogen and carburetted hydrogen, are evolved, along with a peculiar aromatic odour. When the temperature has been maintained at 400° for one or two hours, this stage of the process is complete; the mass has now a dark colour, and contains only 1 to 4 per cent. of oxalic acid, and about 0·5 per cent. of formic. The bulk, therefore, of the mass at this stage consists of a substance whose nature is not yet known, but which is intermediate between the cellulose and oxalic acid.

3. The next stage consists in a simple extension of the last, in which the mass is heated till quite dry, care being taken that no charring takes place. It now contains the maximum quantity of oxalic acid, 28 to 30 per cent.

4. This oxalic acid is now combined with both potass and soda in the grey powder resulting from stage 3. This powder is now washed on a filter with solution of carbonate of soda, which seems to have the singular and unexpected power of decomposing the oxalate of potass, and converting it into oxalate of soda. At all events, it is quite true that all traces of potass are washed out with the solution of carbonate of soda. The only explanation that occurs to account for this unusual decomposition is that oxalate of soda is a more insoluble salt than oxalate of potass, and therefore may be formed by preference.

5. This oxalate of soda is now decomposed by boiling milk of lime. Oxalate of

* Annal. de Chim. et de Phys. t. xli. p. 398.

lime falls as a precipitate, and soda remains in solution. This soda is boiled down, and again made use of with fresh sawdust. This recovery of alkali is also practised with the potass salt which filters through in the last stage.

6. The oxalate of lime is now decomposed in leaden vessels with sulphuric acid. Sulphate of lime is precipitated, and oxalic acid is in solution, which is now evaporated, and the acid separates in crystals, which now need only to be recrystallized to make them quite pure, and fit the acid for all the purposes for which it is employed.

By this ingenious process 2 lbs. of sawdust are made to yield 1 lb. of oxalic acid, and the amount of acid which can be turned out in a week amounts to 9 tons; but the works of Messrs. Roberts, Dale, and Co. could make nearly double that amount. This amount is more than a half of all the oxalic acid which is reckoned to be used all over the world. The process also has so much cheapened the price of oxalic acid, that in 1851 it sold for 16*d.* per pound, now it only costs from 8*d.* and 9*d.* per lb.

A vote of thanks was proposed by Mr. Blanshard, seconded by Mr. Young, and cordially awarded to Dr. Thomson for his interesting communication.

Mr. John Mackay made a few remarks on the carboniferous preparations of Messrs. Pichot and Malapert, of Poictiers, intended for surgical use, and submitted to the meeting various specimens of the different substances introduced by Messrs. Pichot and Malapert some years ago in France, and now generally used by the medical officers in the hospitals in Paris. The forms of the carbon dressings are the charpie,—spongy charpie; bags or sachets of charpie; carboniferous paper, and tissue-paper. Mr. Mackay explained that Messrs. Pichot and Malapert did not lay claim to the original idea of using charcoal as an antiseptic, absorbent, or disinfectant in surgical appliances, but thought they had overcome completely a want long felt of convenient forms in which carbon could be generally employed. Mr. Mackay stated that Messrs. Maw and Son, of London, had been appointed agents for Great Britain, and there was now no difficulty in getting supplies in order that the preparations might be fairly tested.

It was intimated that four essays, in competition for the prizes, had been received, and that the Committee expected to announce their decision at the next meeting.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Tenth Meeting, held at the Royal Institution, Colquitt Street, on Thursday evening, February 26th; the Vice-President, A. Redford, Esq., in the chair.

The minutes of the previous Meeting having been read and confirmed, Mr. James Ward, of Bold Street, was unanimously elected a member of the Association.

The donations announced by the Secretary were: — a specimen of *Podophyllum peltatum* and a specimen of *Podophyllin*, from Mr. H. S. Evans; and some Chinese medicines, from Dr. David Thomson, through Mr. Abraham.

Mr. Abraham said Dr. Thomson, who was an honorary member of the Association, was at present residing at Essequibo, in British Guiana; and he had sent, for the museum, a small bottle, containing very minute pilules, resembling homœopathic pilules, which, it appeared, were bought in Canton, and taken thence to Essequibo by Chinese emigrants. From the appearance of the pilules, he strongly suspected that they contained sulphate of arsenic, though it might be vermilion. Dr. Thomson had also sent a small ball with a Chinese inscription upon it, which he (Mr. Abraham) thought was a hollow ball of wax containing medicine.

The Chairman said his brother-in-law had lately returned from a trip to Japan, and he had brought home with him a great number of curiosities, illustrative of the Japanese customs, amongst which was a small ivory medicine-chest. It seemed that every gentleman in Japan carried his medicine-chest with him, in the form of a small ivory box, about the size of a walnut, with three or four compartments. This was attached to his sash, and he could open it and take out a pill whenever he required it.

Mr. H. Bird exhibited a curiosity, brought from Canton by his brother, consisting of an instrument for cleaning the ears, a tongue-scraper, and a tooth-pick, all of plated metal, attached together by a chain, interesting as a specimen of Chinese electro-plating.

The Chairman exhibited a specimen of wine, which had been submitted to him by Messrs. Withnall and Roscoe, wine-merchants of this town, who informed him that it was a Spanish wine,—a sort of sherry, with somewhat of Madeira about it, and that it contained a greater percentage of spirit than Cape sherry.

The Chairman then proceeded to read his paper for the evening, of which the following is an abstract:—

Australian Products in the International Exhibition of 1862.

Perhaps the most striking object in the Australian portion of the International Exhibition, that ever-memorable record of the world's industry, was the pyramid of the commissioners, representing the quantity of gold exported from Victoria from 1851 to 1861.

This novel illustration of the amazing richness of the colony in the precious metal was well calculated to strike the attention of the public, and enable us to realize in some faintly practical manner the meaning of such sounds as I am about to utter, viz.:—weight, 26,162,432 troy ounces; 1,793,995 lbs. avoirdupois, or 800 tons, 17 cwt., 3 qrs., 7 lbs.; solid measurement, 1,492½ cubic feet; and value, £104,649,728 sterling. The height of the pyramid was nearly 45 feet, and measured 10 feet square at the base.

After treating of the "cost of production," and the proportion between "labour and luck," as shown in the statistics relating to gold mining in Australia, Mr. Redford gave a description of several remarkable nuggets which have been found from time to time, and also mentioned some other Australian minerals. He then proceeded to describe the vegetable products of Australia. As might be expected in a climate so favourable, the vegetable products are numerous and interesting. Forest trees abound of magnificent proportions, valuable alike for their timber, bark, gum, and leaves, from which we shall see abundant essential oils are obtained.

The forest trees consist of about 150 different species, of which upwards of 90 were represented in the Exhibition, and through the skill and great care of Dr. Müller, the Botanist Royal, the whole have been identified with strict botanical accuracy.

The Acacias, of which the wood of 14 kinds were shown, are very abundant in Australia. The pretty yellow plants sold at our flower-stalls must occur to the minds of many; they belong to the same class of Leguminous plants of the sub-order Mimoseæ. The Acacias form a leading feature in the botany of Australia, and are to be seen covering acres of ground, as the Yellow Wattles and others. They produce Gum Acacia and Gum Senegal in India and Africa; and one Tasmanian species—*Acacia sophora*—yields a food which is made into chocolate by the natives. Some few are poisonous. These trees are not generally large; the largest of them, I think, attains to 30 ft. in height, and 1 ft. in diameter. This is the Mayall, or *Acacia homatophylla*. The wood is very hard, and smells of violets; it is dark and beautiful, and much prized for turning, etc. Spearwood, or *Acacia doratoxylon*, as its vernacular name implies, is used for spears and other weapons by the natives; it is durable and hard. Blackwood, another of the Acacias, *Acacia melanoxylon*, is pronounced by the Jurors to be the most valuable of all our colonial timber. It is admirably adapted to every description of light and heavy framing, to cabinet and ornamental work, to shafts and wheels, and all kinds of turnery. It resembles the best walnut, and receives a very high and beautiful polish. The Wattle is the only other Acacia that need be mentioned, *Acacia mollissima*. This tree is almost universal in Australia, and is used by coopers for their staves, while the bark is extensively employed for tanning. The tanning of colonial leather is entirely carried on by means of their own barks, of which the Mimosa or Wattle bark is the most valuable. There was exported from Australia in 1858, 249 tons of bark, value £2,800; and in 1860, 654 tons 13 cwt., value £6,382—it is worth £4 per ton. Such improvements have been made of late in their tanneries and fellmongeries, of which there are a very large number, that colonial-made sole and harness leather is now preferred to the imported article.

Four species of these trees furnish true gums, which exude from the trees as do the Acacia gums of commerce, and in some samples the masses are so cracked as to present a very white appearance. We must now turn to the trees of Australia *par excellence*, I mean the stately Eucalypti, or Gum-trees. These belong to the order Myrtaceæ, or Myrtleblooms, an order comprising within its limits a variety of size which is truly singular, so that we may almost say that in size it ranges, like Solomon's botany, from "the Hyssop which springeth out of the wall, to the Cedar of Lebanon." Professor Lindley remarks — "There are all kinds of intermediate sizes, from the common myrtle bush to the gigantic Eucalpyti of Australia: some rise 200 feet in height with straight trunks, clear of branches for from 100 to 150 feet, and resembling as assemblage of elegant columns. These are crowned with branching tops of light willow-like foliage; and some of the stringy-bark trees rise nearly as high as the Monument without branching."

Timber-specimens of over twenty kinds of these trees were exhibited, and the resins, gums, oils, barks, and other products obtained from them are almost too numerous to mention. Some of the vernacular names are as follows: — Red gum, blue gum, white gum, iron bark, stringy bark, box, messmate, woolly-butt, black-butt, black-wood, manna gum, Swan River mahogany, &c.

The lecturer described several of these products and their uses, and then proceeded to speak of the essential oils yielded by these gum-trees. Thirty-one kinds were exhibited, most of which were from the Eucalypti. The tree producing the greatest quantity is the Peppermint tree, so called on account of the supposed resemblance of the smell of the oil to the odour of peppermint. Two trees are so called, but one has the prefix of Dandenong, or narrow-leaved Peppermint-tree. Of all the samples exhibited the oil yielded by this tree, the *Eucalyptus amygdalina* appears, from its qualities as well as its abundance, to be the most important. They all appear to be fit for illuminating purposes in a very high degree, and for varnishes and perfumery; and they may, at least some of them, be useful in medicine. The oil of the Dandenong, or narrow-leaved Peppermint, is stated to be a thin transparent fluid of a pale yellow colour, possessed of a pungent odour like that of oil of lemons, but coarser and stronger.

The properties of the oil were here described, and with regard to its illuminating properties, Mr. Redford stated that it was not inflammable when brought in contact with flame until quite hot; but it burns with a white bright light in a kerosene lamp. Compared with the flame of American kerosene, it has not quite so much illuminating power, and the light is rather yellow in comparison. This observation does not apply, however, to specimens obtained from Ballarat, which, as well as nine other kinds from the gum-trees, and five from Melaleucas or tea-trees, gave a superior light, and very white in comparison. A great number of substances — gums, resins, etc. — are very soluble in this oil. Particulars were here given with regard to the solubility of various substances in the oil.

It does not appear that these oils are as yet commercially available. What has yet been done must be looked upon as principally tentative of their availability and nature. The process by which the oil is obtained seems most simple and inexpensive. Mr. Redford here made some remarks respecting the production of the oil at a sufficiently low cost, from which it appeared there was a chance of gum-leaves running short. He further stated that this objection has less weight in relation to another of these oils produced from the Mallee scrub, *Eucalyptus oleosa*. The extent of country covered by this scrub in Victoria is stated to be 5,560,000 acres, but the yield of oil is not so large as that of the Dandenong, being only 20 oz. from 100 lbs. (from the Dandenong 3 imperial pints per 100 lbs. of leaves are obtained). The Jurors looked upon this oil (the oil of *Eucalyptus oleosa*) as undoubtedly the first in importance, as the supply of the raw material could be maintained from day to day, as required for distillation, almost without limit.

Several other essential-oil specimens were also described. The Melaleucas, or tea-trees, were next mentioned, and descriptions given of the *M. squarrosa*, *M. linarifolia*, *M. Leucadendron*, and some other trees of the same species. The Sassafras tree, *Atherosperma moschata*, of the Order *Atherospermaceæ*, is now considered a very important one as a valuable addition to the Materia Medica, as its bark contains

an essential oil, obtainable by distillation, which acts with considerable power upon the vital functions. The manufacture of the oil of native sassafras is conducted with regularity and success, and the oil is sold for 15*s.* per ounce.

The physiological effects of this oil being the most important, I shall only refer to them. It appears to have come into general use in the hospitals, not only as being diaphoretic and diuretic like our sassafras, but as a sedative and having a specific lowering action upon the heart. In large quantities it is no doubt highly poisonous. The dose is one drop every 6 or 8 hours. Some further remarks were made concerning the properties of the bark of this *Atherosperma moschata*, and it appears that an infusion of it is sometimes used in the remote parts of the colony as a substitute for tea. A new alkaloid, called Atherospermine, has also been obtained from it by M. Zeyer, of Munich.

Another plant likely to be of great value is the *Pittosporum undulatum*, the blossoms of which yield an essential oil of an extremely agreeable odour, resembling the perfume of the Jessamine flowers; and when we remember that no essential oil of true jessamine, as I believe, has been obtained in quantity beyond a mere curiosity, having a fancy value of about 6 guineas per ounce, if I remember rightly, then the usefulness of such a substitute will at once appear. The leaves of this plant also yield a very bitter extractive matter.

The Santalums were next mentioned: one of them is the *Santalum acuminatum*, which yields the native or Quandang peach, which makes excellent preserves. Another is the *Santalum persicarium*, or Sandal-wood.

Mr. Redford also remarked that it deserved recording that the gum-leaves had been applied to another and rather novel purpose. In October, 1837, Mr. G. W. Prangst, some of whose products we have now before us, obtained a patent in the colony "for obtaining by distillation, from the several varieties of gum-leaves,— first, a spirito-oleaginous compound, or crude oil; and secondly, carburetted hydrogen-gas, pyroligneous acid, and tar." This patent gas was successfully manufactured at Kyneton,—a township some distance from Melbourne, which was lighted for two years with the gas. The quantity obtained from a ton of leaves was from 9,000 to 10,000 cubic feet, —a larger yield by far than that from wood, and of a greater illuminating power. But it seems that the patentee was obliged to resort to an admixture of cannel coal at the Kyneton Gasworks, to bring it up to the required standard, and ultimately, on account of the difficulty of procuring gum leaves, to use cannel alone.

I must now pass on to the resins. Of true resins there are two kinds: that from the trees called respectively Mountain Cypress Pine, or *Callitris cupressiformis*, and Desert Cypress Pine, or *Callitris verrucosa;* the other from the grass-tree, or *Xanthorrhœa Australis*. Both those resins were described, and with regard to the latter, Mr. Redford remarked that it seemed to have some resemblance to Gum Benzoin, and also to Dragon's Blood. It is very soluble in alcohol, and in Eucalyptic oils. Ether takes up but little, and turpentine and the drying-oils take up but very little. It was critically examined by a gentleman in Melbourne, who stated that it contains Cinnamic acid in addition to Benzoic acid, and that Picric acid was developed by the action of nitric acid upon it. The polishers of Australia use it instead of benzoin, and I thought I would try its capabilities as a polish ingredient. I made so bold to use at the same time a small portion of the Australian sandrac, so that my polish is composed of shellac, sandrac, Australian grass-tree gums, both kinds. The results pleased me very much; I never saw a finer polish, or one which came up so quickly.

A very interesting resin, of a fossil character, has been discovered at Brass River, in the Westport district, about 50 feet below the surface.

Immense quantities of gum-resins are frequently discovered in internal cavities of most of the gum trees.

I must not omit to speak of the Manna Gum, of which I had the honour to inform this Society previously. The Commissioners have favoured us with a sample of this very interesting substance. The Eucalyptus which exudes this sweet concrete is the *Eucalyptus viminalis*, which Lindley calls *mannifera*. The taste is very sweet, and it contains a large quantity of grape-sugar, with about 5 per cent. of the substance called mannite. Its medicinal properties are almost *nil*, for while Lindley says it is less aperient than manna, my brother (who has resided a considerable time in Australia,

and who has forwarded much valuable information) says you may eat a quarter of a pound of it without inconvenience, and the Jurors pronounce it of no medicinal value.

Much more that is interesting might be said on this subject, as for instance of the vine-growing and the wine samples, the fibres, arrowroots, ginger, honey of six years of age, silk, salt, and also of a dye made from a Coccus fed on gum-leaves; but having already exceeded a reasonable limit I will inflict no more, but trust that the want of originality in my paper will be atoned for by the interest of its details. The Australian products lately presented to the Association by the Comissioners for Victoria were exhibited, and Mr. Redford referred to many of them in his paper.

Mr. R. Evans said he had been informed by a medical gentleman that there was in the English market a gum, called the Coire gum, which was valueless in this country, but out of which the Americans were making a good thing. He had been offered it as low as 4*d*. a pound. It was all being purchased by the Americans, who dissolved it in the solvent oils from Australia, and made the varnish for photographers.

The Chairman said he had observed a peculiar odour about American photographic varnish, which reminded him very much of the Eucalyptic oils, but he had attributed it to oil of lavender.

On the motion of Mr. H. S. Evans, seconded by Dr. Nevins, thanks were unanimously voted to Mr. Redford for his paper, and the proceedings terminated.

The Eleventh Ordinary Meeting, held at the Royal Institution, on Thursday evening, March 12th, 1863; the President, J. Shaw, Esq., in the chair.

The minutes of the last meeting were read and confirmed, and the following donations announced:—To the Museum, several fine specimens of colours, from Messrs. Hare and Co., of Bristol; three dozen tube-bottles, with offer of as many more as may be required, gratis, from Mr. Evans, Cleveland Square; specimens of albertite, Torbane Hill mineral, Wigan coal, and a very curious specimen of white Australian coal, with fossil sporules separated from it, from Mr. William King. To the Library, 'Guide to the Great Western Railway,' from Messrs. Hare and Co.; the 'Pharmaceutical Journal' for March, from the Society; the 'Technologist' for March, from the editor; and the 'Journal of the Polytechnic Society of Liverpool,' from the Society.

The thanks of the meeting were given to the donors.

Mr. William King made some interesting remarks respecting the coal specimens which he presented to the museum.

Mr. H. Bird read a paper "On Coal and Coal-mining, Colliery Accidents and their Prevention," which he illustrated by several experiments and diagrams. After giving a short description of the geological and mineralogical character of coal as met with in Great Britain, he enlarged on the best means of ventilation, and the consequent prevention of the too often occurring explosions. The appliances for ventilating mines were divided into chemical and mechanical ventilators: the chemical comprised the furnace, the steam jet and the waterfall; the mechanical, exhausting and blowing machines, consisting either of revolving vanes of various constructions, Archimedean screws, or immense pumps, some of which had been made so large as to exhaust ten or twelve thousand feet at each stroke. After giving the probable manner in which fire damp had been generated, he concluded by stating that the number of lives lost in collieries had been doubtless great in former years, but it was exceedingly gratifying to find that this loss was yearly decreasing from the superior manner in which the various colliery arrangements were carried out. He instanced that in the mines of Messrs. Pearson, Knowles, and Co., who constantly employ about 500 men, there had been but two accidental deaths during the last fifteen years, both of which were attributable solely to the men's own carelessness; indeed, the neglect of the men to comply with their simple instructions was the chief difficulty of the owners and managers, and a most fruitful cause of accidents. The constant presence of danger inures the men to it; its very familiarity breeds contempt. It was however impossible to deny that in spite of the most perfect appliances, the careful and vigilant supervision of the overlookers, and the strictest attendance of the miners to their instructions, there were pe-

culiar circumstances attending mining operations, such as the subsidence of the earth over the workings, the existence of the "blowers," etc., that might result in fearful accidents no human foresight could possibly have prevented.

Votes of thanks to Mr. Bird for his paper, and to Mr. King for his communication, were passed, and the proceedings terminated.

LEEDS CHEMISTS' ASSOCIATION.

The Third Ordinary Meeting was held in the Town Hall, on Monday evening, March 9th, 1863; Mr. REYNOLDS in the chair.

Mr. J. T. Pearson and Mr. E. Eddison were elected Members.

Mr. T. W. Gissing, of Wakefield, was elected a Corresponding Member.

The Committee reported that they had made arrangements with Mr. H. Denny, A.L.S., Curator of the Philosophical Society, to deliver a course of eight lectures upon Structural and Physiological Botany; the fee to Members and Associates being fixed at 4*s.* for the course.

It was reported that a central and convenient room had been engaged at 5, Cookridge Street, for the purpose of a library, to be open every evening except Saturday, between the hours of eight and ten o'clock. The first contribution to the library was the valuable one of a complete set of the 'Pharmaceutical Journal,' from the President and Council of the Pharmaceutical Society.

This donation was acknowledged by the following resolution, moved by Mr. Thompson, and seconded by Mr. Ward:—

"That the warm thanks of the Association are hereby tendered to the President and Council of the Pharmaceutical Society for their handsome and liberal donation to the library of a complete set of the 'Pharmaceutical Journal.'"

Mr. E. Thompson read a paper "On a Cheap and Accurate Chemical Balance," illustrating it by an instrument which he had constructed. The beam is simply a long bar of light wood, about eighteen inches long; the fulcrum and supports are formed from pieces of thermometer tubing. At one end is a permanent leaden counterpoise, and at the other the single scale pan employed. All weighings are conducted upon the principle of substitution, the counterpoise and substance to be weighed being first brought to a state of relative equilibrium, and then the latter removed from the scale, into which weights are put until the equilibrium is again restored.

Mr. Thompson said that his practical experience of the balance during the past three years enabled him to assert that it was reliable for taking specific gravities, and the various operations of commercial and pharmaceutical analysis. He decidedly preferred light wood for the material of the beam to glass or other proposed substitutes. The instrument was one which every apprentice could construct for himself. (Mr. Thompson's original paper was published in the 'Pharmaceutical Journal,' vol. i. 2nd ser. p. 371.)

Mr. James Abbott gave an instructive and interesting description of "The Starch Granule and its Varieties."

The physiological, chemical, botanical, and technical relations of starch were treated, and especial attention given to its microscopic characters, which were illustrated by a series of microscopes, and by diagrams.

ORIGINAL AND EXTRACTED ARTICLES.

M. ORFILA AND THE ARSENIC QUESTION*.

BY MR. JOSEPH INCE.

Matteo-José-Bonaventure Orfila, one of the most accomplished singers, as well as one of the most celebrated chemists of his day, was born at Mahon, in the island of Minorca, April 24th, 1787. His father started him when

* For the dates and some facts, I am indebted to M. Pitre-Chevalier,

fifteen years old as second pilot on a coasting vessel; on his return his education was entrusted to a Grey Friar, who taught him Greek and Latin, together with the usual modicum of scholastic logic. But having a natural bent for science, he early forsook the Classics to study medicine at Valencia, where he gained the first prize in chemistry and physics. He cultivated mathematics at the same time, learnt French with a Gascon, and English with an Irishman.

From this period dates his passionate devotion to chemistry. Finding his teachers somewhat behind the age, he bought the works of Fourcroy and Lavoisier, turned his own room into a laboratory, and set earnestly to work. From Valencia he went to Barcelona, with which place ended his career in Spain. The Junta (members of the Spanish Council) recognized his merits, and sent him, with 1100 francs (£44), to France. On his way thither, a companion borrowed a thousand francs, but forgot to restore the loan. "My friend" (to quote Orfila's own pleasantry) "was wanting, *et en même temps or fila;*" so that the Spaniard, after defraying the expenses of the journey, arrived at Paris with sixpence and a guitar. Perhaps (not needlessly to interrupt the narrative) this will be the most fitting place to mention the rare musical and vocal accomplishments of the future man of science. When eight years old, Orfila was taught music by a monk, and soon afterwards had lessons in "time" from a Doctor Siguier. Owing to a too severe parental chastisement, he was seized with stammering, of which painful defect he was cured by the same doctor, who made him sing for several months successively in the parish choir. The remedy was perfect, for he was gifted in after-life with a rapid and most facile utterance. A little later, at Barcelona, he learnt that an Italian troupe was about to give 'La Molinara' of Paësiello: he bought a ticket, witnessed the performance, and from that hour was music-mad. He began to practise on all sorts of instruments—the flute, piano, violin, and guitar; but, like a true Spaniard, he decidedly preferred the latter. Universal opinion in Parisian circles allowed that he was one of the most finished singers of his day, and that had he chosen the lyric stage for his vocation, his success would have been undoubted. Yet, with an exquisite and rarely modulated voice, to which, in common with every resident in Paris, I can bear testimony, he was content to remain simply an amateur, though his personal appearance and his prepossessing manner were strong temptations to lead him elsewhere than towards Toxicology.

Once established as a student in the French capital, an uncle at Marseilles sent him a hundred dollars (£20), the Junta made him an annual pension of 1500 francs (£60) until December 27th, 1811, when he took his medical degree, and the supplies were stopped.

His father now sent for him back to Mahon, but the son had other views: he began a free course of chemistry in his own room, his first pupils being Jules Cloquet, Béclard, and Edwards, a celebrated trio, who became his warm friends for life. His subsequent career was brilliant: chosen successively one of the physicians of Louis XVIII. in 1816; Professor of Forensic Medicine in 1819; Member of the Academy in 1820; Professor of Chemistry at the School of Medicine in 1823 (which last position he held until his death), and finally Dean of the same school. It is difficult to describe the extreme enthusiasm with which his lectures were attended. The students mobbed the entrance-door, rushed with dangerous haste to gain the foremost places, and in less than five minutes crowded the vast theatre. The excited audience acted strongly on the lecturer, who, with a quick and sparkling delivery, aided by an ample share of buoyant spirits, entered on his subject. In style and manner he was something like Pereira, but more gay. His subject seemed to dance, and he used a profusion of anecdote, for which reason many a chemical theory

is for ever linked in my mind with the most incongruous associations. I have known him convulse his hearers on the most unpromising theme of Iodide of Potassium. Yet if he was seldom serious, he was always clear, and rarely, if ever, has chemistry been taught in a way likely to be so well remembered.

Probably his most attractive lecture was the one on Arsenic, which extended over several days. I had originally thought that it would have been interesting to the English student to be presented with a verbatim report of at least its main divisions; the length of this article however will render such a course undesirable: a few of the concluding sentences must suffice. "Gentlemen,—In considering the arsenical question, three things must be attended to: in the first place, prove, and be well sure, that arsenic exists; secondly, study the pathology of the case and general symptoms; and thirdly, be prepared to undertake the treatment of the patient. The first point is entirely chemical: examine the urine, the matter vomited, and the corpse; but recollect one thing, that the reagents do not give the same precipitate with organic matter as they do with pure arsenious acid. The human stomach is not a retort. If you mean to effect anything, destroy the organic matter—boil it to coagulate the albumen, which in its precipitation draws down (*entraîne*) with it the other substances. Filter this liquor, evaporate it to a quarter of its bulk, and again filter, when a further deposit of organic matter is obtained. Alcohol may be added, by which means the liquor is rendered turbid, and arsenious acid is dissolved. Now pass a stream of sulphuretted hydrogen through the liquor, on which a yellow sulphuret of arsenic is precipitated. It is necessary to wait some time when alcohol has not been used. I have known students come up for their examination who did not know this test, and yet the women in Paris used, during a certain trial, to meet at the corners of the streets, and discuss the presence or absence of the yellow sulphuret.

"In this reaction the oxygen of the arsenious acid combines with the hydrogen of the hydrosulphuric acid to form water, whilst the sulphur is united to the metal. By means of this reagent arsenious acid may be detected in a liquid containing only the $\frac{1}{100000}$th part.

"The precipitation is instantly effected by gently warming the mixture, and by the addition of a small quantity of hydrochloric, nitric or sulphuric acid. Take this yellow sulphuret, mixed with potash and carbon; place the whole in a small glass tube, heat, and metallic arsenic is obtained. Or else take the sulphuret, treat it with nitric acid, and heat: arsenic and arsenious acids are produced. Introduce the product into water, and finally into Marsh's apparatus, and by its means an arsenical ring is deposited in the tube, and arsenical spots* (*taches*) may be deposited on a plate." [For a full description of the relative value of Marsh's apparatus as a test, together with the characteristic distinctions between Arsenic and Antimony, consult the paper by Alfred Taylor, Pharm. Journ. vol. ii. p. 261, new series. The passage relating to Orfila is as follows:—"The first improvement of Marsh's method of analysis was made by Orfila, in 1839. This toxicologist deflagrated the organic matter in a dry state with Nitrate of Potash, according to a plan suggested by Rapp. He subsequently employed Nitric Acid, to destroy the organic matter; he then brought the mass, by evaporation, to a dry, carbonaceous state, and acted on the residue by Nitrohydrochloric acid. The arsenic was dissolved in water as arsenic acid, and in this state it was placed in the hydrogen apparatus. By means of these processes Orfila was enabled to concentrate the arsenic, and to remove it from the organic matter; and thus, by the aid of Marsh's tube, he succeeded in detecting the poison in

* By the term "spots," used for the sake of brevity in this paper, is meant a film of deposited metallic substance.

nearly all the organs and fluids of the body." To this I may add, that Orfila insisted strongly on the use of his own particular form of apparatus, in which he maintained the tube was of exactly the proper length and size, and in which the flame was accurately managed. A drawing of it will be found in his 'Traité de Chimie,' vol. i. plate 7, fig. 3.]

"But in what way are these rings or spots proved to be really arsenic? Heat them and they will move, and then, if heat be continued, will volatilize; had they been composed of antimony, they would have remained. The arsenical ring is brilliant, colour of steel; the spots are brown or fawn and shining; those of antimony are blue. The spots of arsenic disappear when touched by chloride of sodium, those of antimony remain. Heated gently with iodine, the spots of arsenic become yellow, those of antimony turn orange. On the addition of nitric acid both the spots of arsenic and antimony disappear, but those of arsenic leave a white deposit, those of antimony a yellow residue. When a spot of arsenic has been treated by nitric acid as above, it is dissolved; by heating the solution a white or yellowish-white residue is obtained. This may be divided into two portions: one on cooling gives a beautiful red-brick colour with nitrate of silver in a concentrated solution; the other, dissolved in water and permeated by a current of sulphuretted hydrogen, furnishes a yellow precipitate of sulphuret of arsenic, especially if a drop of sulphurous acid be added, which brings back to the state of arsenious acid the arsenic acid which was formed by the action of the nitric acid on the arsenic.

"With one drop of arsenious acid a great number of arsenical spots can be obtained, and with one single spot the presence of arsenic may be proved.

"Again, gentlemen, let me tell you the essential character of arsenious acid." (This was Orfila's invariable rule, and he was content to have the essential character given in an examination.) "Placed on hot coals, this acid is decomposed, and furnishes metallic arsenic, which is sublimed, in thick brownish vapours, with a garlic odour. These vapours, absorbing the oxygen of the air, pass into the state of white arsenious acid. But if instead of heating arsenious acid on hot coals, it is heated in a crucible, or on a strip of iron or copper heated to redness, it is volatilized in the form of white vapours, *without* being decomposed, and *without* the garlic odour. Hydrogen gas, with the aid of heat, decomposes arsenious acid, the products being water, arsenic, and arseniuretted hydrogen.

"Heaven grant, gentlemen (à Dieu ne plaise, messieurs), that your arsenic, if found, comes from the things examined, liquid or solid, and not from your reagents." (Then followed a long description of the means of purifying the various tests.)

"Lastly. When you suspect poisoning by arsenic, make the patient vomit. You cannot extract the poison altogether, endeavour therefore to reduce it into some other compound much less energetic. The best remedy I know at present is the hydrated sesquioxide of iron, which acts by the instantaneous production of a tolerably inert arsenite of iron."

Enough has been offered to give some general idea of this famous lecture; the dexterity of the experiments, the radiant appearance of the professor, and the enviable grace of his delivery, unencumbered by a single note, cannot be here reproduced. As Dean of the Faculty of Medicine, Orfila was much attacked; indeed, he was constantly in the wars, whether rightly or wrongly, it is scarcely for a stranger to pronounce. He has been blamed for the extreme rigour of his convictions, and for his little allowance either for the opinions or the abilities of his opponents. His last lecture was on Potash and Soda; the next day after its delivery he was taken ill, and seven days afterwards he died. The gaiety of his manner remained with him to the last, and he bore no trace of advancing age beyond his hair, which was silver-

white. At his death he left a large legacy to the School of Medicine, and bequeathed his body to the students for dissection.

Let us go back a little, and we shall light upon a strange and sinister episode. An event occurred which made Orfila's name celebrated throughout France. In January, 1840, M. Lafarge, an iron-master, died suddenly at a place called Glandier; the dead man's family accused the wife (Marie Cappelle) of having poisoned her husband by means of arsenic. The case was open to suspicion. A marriage arranged in rash and inconsiderate haste proved most unhappy. The wife a delicate, refined Parisian, with no small powers of fascination; the husband coarse in his habits, and rough in manner: these were elements not likely to prove harmonious.

> "Je veux vous écrire une grande nouvelle" (wrote Madame), "mon cher Monsieur Elmore, une nouvelle que je ne crois guère, qui m'étonne plus qu'elle ne vous étonnera. Enfin, moi si difficile, si réfléchissante aux mauvais côtés de toute chose, je me marie en poste. Mercredi, je vois un monsieur chez Musard: je lui plais, et il ne me plaît pas beaucoup. Jeudi, il se fait présenter chez ma tante; il se montre si soigneux, si bon, que je le trouve mieux. Vendredi, il me demande officiellement. Samedi, je ne dis pas oui, mais je ne dis pas non, et Dimanche, aujourd'hui, les bans sont publiés."*

Such was the wild opening of the tragedy. Lafarge had talked of a charming villa, of funded property, and of a prosperous business; Madame found instead a wretched and dilapidated house, a violent husband, and a financial crisis. It is not within the purpose of this sketch to trace the details of this strange story of poison, love, and robbery; the best and most impartial account is given in the 'Causes Célèbres.' Family quarrels had subsided into something like a calm. Madame had determined to accept her lot; peace was restored. Lafarge, always in difficulties, raised money in many questionable ways, specially by issuing false bills, in which nefarious plans he was assisted by a man called Denis. Suddenly he communicated to his wife a supposed important discovery in the manufacture of iron; it was to realize wonders, but he wanted money. A mutual exchange of legal documents was made between them, each settling their respective property on each other. Armed with this reinforcement Lafarge set off to Paris, there to develope his ideas, and obtain a patent. The wife, wishing to gratify the absent husband, sent her portrait, and with it a box of cakes made by her mother-in-law. The box was opened, Lafarge ate a small portion, and was taken ill. He came back to Glandier, took to his bed, and was seized with violent vomiting. From this moment the mother-in-law had sinister suspicions of the wife. The patient grew worse and worse; the symptoms assumed an alarming character, and in a few days he died. The entire family first hinted, then whispered, and at last boldly declared that the unfortunate man was poisoned, and that the hand that had presented the fatal cup was no other than that of Marie Lafarge.

Circumstances lent a colouring to the notion. A slight streak of white powder had been noticed in a cupboard, and in a drawer was a small gallipot

* "I am going to tell you a great piece of news, my dear Mr. Elmore, news which I scarcely believe myself, and which astounds me more than it can astonish you. Well, then! I, who am so difficult to please, so prone to look at the dark side of everything, am going to be married post-haste. On Wednesday, I see a gentleman at Musard's; I please him, he does not please me much. Thursday he gets an introduction to my aunt, and appears so delicate in his attentions, and so good, that I think better of him. On Friday he demands me officially in marriage. On Saturday I do not say yes, but I do not say no; and on Sunday, this very day, the banns are published."

holding the same substance. This powder Madame had sometimes mixed with the remedies prescribed. She declared it to be gum arabic. She had herself bought arsenic from a chemist, ostensibly to kill rats. Here is the the letter:—

> "Mon domestique ayant sottement manipulé une mort aux rats, il m'en a fait une pâte si compacte, si pourrie, que M. Bardou m'a refait une petite ordonnance, que je vous envoie, Monsieur, afin de mettre votre conscience à l'abri et ne pas vous laisser croire que je veuille, pour le moins, empoisonner tout le Limousin." *

The man Denis had also by her orders bought arsenic for the same intent. This man, the tool of Lafarge, was her evil genius. Once, on his return from Paris, on the illness of his master, he exclaimed to her, "I am the master now, and will put you out of doors;" and soon after the death, he declared that he wished Madame sawn in four pieces. These and other barbarities were recollected at the trial, and when he was sought for, though officially one of the witnesses, he could nowhere be found. Suspicion once excited can rarely be appeased, especially when there is a gaping village to exaggerate the rumour and to fan the flame. The case could be no longer slighted, and four medical men were engaged to report accordingly before a court of law. These were their general conclusions:—

1. That the cough-mixture contained a large quantity of arsenious acid.
2. That the sugared water contained also arsenious acid.
3. That the beer, gum-water, and powdered sugar contained no poisonous matter.
4. That the liquids vomited did not contain arsenious acid, at least, not in sufficient quantity to be affected by reagents.
5. That the liquids contained in the stomach, as well as the stomach itself, contained arsenious acid.
6. That the death of Lafarge was the result of poison, occasioned by the absorption of arsenious acid.

The trial began in the midst of terrible excitement. M. Decous, the public minister whose duty it was to give a general summary of a case for the guidance of the jury, pronounced instead a violent and menacing invective (affairs were complicated by the introduction of a second charge of a robbery of jewels, which I must only mention). "What have you done, Marie Cappelle?" said this impartial functionary, "there is no example of such conduct in the annals of justice! There is no other example of a deed so bold, so rash!" The witnesses were called, and a mass of circumstantial evidence was produced. There was the purchase of the arsenic—the paste made for rats, which, on examination, contained *no* arsenic; the packet given by Madame, and buried in fear by a servant in the garden, supposed to be arsenic, but which proved to be carbonate of soda; the original poisoned cakes that went to Paris, the family discord, and the known unhappiness of the marriage.

But without doubt, the great question to determine was, whether Lafarge *had* died of poison. A first analysis had already been made, but it was not held sufficient. The local physician sought an interview with Orfila, and submitted to him the conclusions that had been arrived at. Some time afterwards, the Counsel for the defence wrote a letter to the great toxicologist, and received the following answer:—

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* "My servant having stupidly prepared a rat-poison, has made it into a paste so hard and mouldy, that Mr. Bardou has given me a little prescription, which I send to you to quiet your conscience, lest you might fancy that I wanted nothing less than to poison the whole of Limousin."

"Paris, August 20, 1840.

"Sir,—You ask me in your letter of the 17th of this month, if it is sufficient to affirm that a liquid extracted from the digestive canal of a corpse, or prepared by boiling a part of this canal in distilled water, contains arsenious acid, on obtaining with it and sulphuric acid a yellow precipitate, flocculent, and soluble in ammonia? No, Sir. All medico-legal men prescribe the reduction of the yellow precipitate by some means or other, and the extraction of metallic arsenic. I have for a long time insisted in my works on the necessity of having recourse to this extraction, and I have severely blamed those who, having neglected to do so, concluded, nevertheless, on the presence of an arsenical compound in the yellow flakes in question. In 1830, Barruel and myself related, in the third volume of the 'Annales d'Hygiène,' a judicial circumstance, in which you will find the solution of the question now addressed to me. Some experimenters, whom it is useless to mention, raised grave suspicions of poisoning on this sole ground, that they had obtained, in treating certain liquids by sulphuric acid, a yellow precipitate, flocculent, and soluble in ammonia. We ascertained that this pretended yellow arsenical preparation did not contain an atom of arsenic on attempting to reduce it, and that it was nothing else than some animal matter contained in the bile. M. Chevallier has just inserted in the last number of the 'Journal de Chimie Médicale,' a note, in which he announces his having twice discovered, since 1830, an analogous substance. "Orfila."

This important declaration rendered a new examination necessary. Half of the organic matter and suspected substances were entrusted to MM. Dubois, father and son, and Dupuytren. On the 5th of September, these gentlemen declared unanimously that the substances and liquids which had been given into their hands, treated by the most recent methods, and particularly by Marsh's apparatus, did not yield the smallest of arsenic traces. It was therefore their opinion that these substances did not contain one fraction of arsenic. Great was the astonishment of the court. Madame Lafarge lifted up her eyes to heaven, and clasped her hands with grateful fervour.

Her advocate was overcome by his emotion, and the counsel for the accusation were dumb, whilst the populace instantly veered round in favour of the accused. Yet how to account for such an amazing contradiction? The Court was not satisfied, and it decreed the exhumation of the body, and another series of experiments.

The corpse accordingly was taken up, and the opening of the coffin revealed the ghastly remains in a loathsome state of decomposition.

The hideous paste (for so it was) was brought into the assembly: six furnaces, fed by a huge brasier, were ranged in a circle round it, but yet the exhalations were fetid beyond description. Again the analysts repeated their experiments; again they failed to detect one trace of arsenic. Madame was triumphant, and her advocate was in the height of jubilation. Short was the gleam of hope; a new last trial was determined, and Orfila, with two others, were summoned. They came, and instantly began their labours, while, with one common consent, the discussions on the subject ceased. It was on the evening of the 15th of September that the great actor made his appearance on the scene.

"I am about," said the illustrious savant, "to divide what I have to say in four parts:—1. I shall show that arsenic exists in the body of Lafarge; 2. That this arsenic does not proceed from the reagents with which we have operated, nor from the earth which surrounded the coffin; 3. I shall show that the arsenic obtained by us does not come from that arsenical portion

which exists naturally in the body of man; 4. Lastly, I shall show that it is not impossible to explain the diversity of the results and opinions in the experiments which have been previously made, as compared with our own conclusions. Arsenic exists in the body of Lafarge, for a portion of the stomach, the liquids which have been there found, and the matter vomited, submitted to carbonization by nitric acid, and then introduced into Marsh's apparatus, have yielded a small quantity. A second experiment, made with a part of the thorax, abdomen, liver, heart, intestinal canal, and brain, has also yielded a small portion of arsenic. The solid portion, not dissolved by the boiling of the two preceding experiments, has been calcined, and has furnished a considerable quantity of arsenic. The arsenic did not come from the reagents employed, for they had been those already used, and yet arsenic was not discovered. The nitric acid was distilled over nitrate of silver, and therefore contains no arsenic; the arsenic was not that naturally contained in the body, for although a minute portion does exist naturally in the bones, it is allowed that with the means we possess at present, no arsenic has here been detected in the internal organs; and it is on these we have experimented solely. Lastly, the discrepancies in the various analyses may be readily accounted for; one reason at least being that Marsh's apparatus is one of recent date; it has not yet been thoroughly studied, and those even who have studied it find much difficulty in its use. Indeed, we ourselves ceased occasionally to obtain proof of the presence of arsenic, knowing it to exist. This is owing to the flame being a little too strong, or to the porcelain-plate being either too near or too far, and there are many other reasons. It is not therefore extraordinary, when such minute quantities are under examination, that no result is obtained. I am happy to have to bear testimony to the skill and talent of the experimenters who have already operated, but it is evident that they have acted upon too small quantities; and secondly, that Marsh's apparatus has been employed with too strong a flame, whereby the small quantity of existing arsenic has been volatilized."

Such is a short outline of this celebrated report. The same day the hair of Madame Lafarge went nearly white. It is needless to prolong the narrative, but I would earnestly commend to all lovers of forensic eloquence the speech for the defence. For two days did the zealous advocate address the audience, but the verdict had been already given before the official announcement of "The accused is guilty,—there are extenuating circumstances."

Hoping against hope, the counsel for the defence sent for Raspail. Few chemists are unaware that Orfila and Raspail were held in wonderful repute, and that probably no two human beings more cordially detested each other. Raspail came, literally post-haste; he arrived just—too late, sentence had been pronounced. Seldom has a man such a splendid chance; it should have been the tide in his affairs to lead to fortune, but he missed his opportunity. Guided by some ill-starred influence, he wrote a florid and impassioned sketch of his interview with the condemned, and furnished a report that should have breathed nothing but the details of abstract chemical analysis, but which was redolent of invective, and loaded to the muzzle with personality. Still his statement contained some startling declarations. He said that the marks on two of the plates used by Orfila were so small and wanting in character, that he should hesitate to pronounce them arsenic. "A condemnation founded on two plates is a deplorable fatality." The marks on the third plate he allowed to be arsenical; "but they were obtained by the use of the nitrate of potash that M. Orfila had had the precaution to bring from Paris. Was it pure? M. Orfila had left behind him all his reagents, except his potash, his zinc, and his nitrate of potash, by means of which he had obtained the arsenic deposited on the third plate."

Madame Lafarge was grateful for the kind interference of the distinguished

chemist, but she expressed her regret in the letter that conveyed her thanks, that his opinions had not been expressed in a wiser and more temperate manner.

One last word upon the subject. Even with the few details here presented, this one fact is undeniable, that though the presence of arsenic was made tolerably certain, there was not a shadow of anything beyond circumstantial evidence to prove that the husband was poisoned by the wife. Two eminent Prussian magistrates wrote a remarkable memoir in German, to demonstrate that there was more suspicious evidence relative to the man Denis, who has been already mentioned. The sharer in the nefarious plans of his master, he arrived in Paris before reception of the fatal cakes. Why had he left Glandier? This same Denis returned home three days before Lafarge,—he was there during the whole time of the poisoning. He was constantly with the deceased, and expressed himself in terms of the most rancorous hatred towards the accused. So violent had been his language, that he was denounced at the trial as no fit person to be a witness. "We do not accuse Denis," said the Prussian magistrates, "but we will say that we should have found, on the part of the Advocate-General, an accusation against him better founded than against Madame Lafarge."

It is foreign to the object of this journal to discuss the point. Let us not wrangle as to whether the grave closed over her innocence or her guilt; she is gone to appear before a higher tribunal and an unerring judge.

26, *St. George's Place, Hyde Park Corner.*

REMARKS ON THE CHEMICAL EVIDENCE IN THE LATE CASE OF POISONING AT LUDWELL, WILTS.

BY MR. JOHN TUCK.

This case of poisoning is remarkable for the difference of opinion expressed by the medical men engaged upon it, and for the angry discussions it has given rise to. It is also invested with an especial interest, and becomes apparently more complicated on account of there being a possibility of tris-nitrate of bismuth contaminated with arsenic having been administered to the deceased. It also again shows us very strongly the immense importance of that salt being prepared *absolutely free from that dangerous contamination*, which can be done without having recourse to any very expensive or difficult process of manufacture.*

It makes one shudder to think even of the bare possibility of a person being sent into the presence of his Creator through an impurity in one of the most important articles of the Materia Medica; while, on the other hand, society does not seem safe if poisoners, murderers of the blackest dye, shall be allowed to escape justice from this same cause.

From the evidence given before the magistrates it would appear that Dr. Shettle was called to attend a Mrs. Kiddle, of Ludwell, on August 25th; she appeared to be suffering from irritation of the stomach, similar to chronic gastritis, owing to the remedies used not producing their desired effect; he suspected cancer; the sickness and retching still continued—in fact increased, no matter what remedies were prescribed. He was then led to believe that the sickness was occasioned by some irritant, and wished to have a second opinion. Dr. Roberts, of Salisbury, was called in on October 14th, and he gave it as his opinion that Mrs. Kiddle "was dying of malignant disease of

* See a paper in the January Journal by Dr. Herapath.

the stomach." No medicine was administered after October 8th, and death took place on October 22nd. A *post-mortem* examination of the body was made by Dr. Shettle, and taking the state of the body and the symptoms, he was of opinion that "Ann Kiddle died from the effects of arsenic." He found a cancerous growth on the under part of the œsophagus, which he had suspected before death; but to quote his own words:—"I do not consider that a sufficient cause of death. In an active state it would be likely to cause sickness; it was not in such an active state, and I do not attribute the sickness under which she laboured to it. There was no cancerous disease in the stomach." These were the principal points in the evidence of Dr. Shettle, who, after having made the *post-mortem* examination, for his own satisfaction sent the œsophagus, stomach, bowels, and liver, to Dr. Herapath, of Bristol, for analysis.

Dr. Herapath deposed, in evidence before the magistrates, the following:—"I examined the contents and found intense inflammation of the lining membrane of the stomach, which at once led me to believe that some irritant had been employed. I accordingly endeavoured to ascertain the cause of the inflammation, without having received any previous clue. Upon the duodenum I discovered a small patch, which appeared to be the result of cancerous deposit. It was about the size of a finger-nail. The stomach was free from cancer, but its mucous membrane was much inflamed. There were no contents in the stomach, and I failed to detect any solid particles which might have been deposited. I dissolved portions of the stomach and intestines, and discovered the presence of several metallic substances; among the rest, arsenic, bismuth, and copper, and I acquainted Dr. Shettle with the result. I subsequently found silver and antimony in the same fluid. The arsenic predominated very considerably over the other metals. The copper was a mere trace, but the bismuth was in larger proportion over the two last-named metals. I did not rely upon one test, but by various processes I proved the existence of arsenic and metallic poisons. The tests I used were—first, sulphuretted hydrogen through a solution of the stomach in hydrochloric acid; secondly, producing arseniuretted hydrogen by Marsh's process, as modified by Fresenius; thirdly, by Reinsch's test. The quantity of arsenic actually weighed was the $\frac{80}{100}$ part of a grain. Afterwards I wrote to Dr. Shettle, asking him what he had given to the deceased. He then wrote to me telling me what he had given to her. He accounted for bismuth and silver, but not for copper, arsenic, or antimony. By employing the three separate processes I got rid of any objection to the tests which I employed and the results found. There is no doubt that there was arsenic in the viscera. The purity of the agents which I used had been previously established. I subsequently examined the liver and bile, and on opening the gall-bladder I found two large gall-stones. In the bile I found traces of arsenic. On examining the liver I found a very large quantity, when employing Reinsch's test, of a white metallic deposit on the copper. This I afterwards found to be a mixture of silver, mercury, and arsenic."

Dr. Herapath afterwards examined twenty-seven out of twenty-eight specimens of drugs administered to the deceased by Dr. Shettle, and in no case could he find any arsenic; and in cross-examination stated:—"In my opinion death was produced by inflammation of the mucous membrane produced by an irritant. The arsenic found in the body was sufficient to account for death, although not enough to cause death. The smallest amount of arsenic on record which has produced death is two grains. I found $\frac{80}{100}$th part of a grain; I only examined part of the body of the deceased, whereas arsenic would be diffused throughout the entire system."

At the adjourned inquest the following additional evidence was given by

Dr. Shettle:—"The metallic medicines I gave her were bismuth and silver; bismuth is considered by some to contain traces of arsenic, but that which I gave her did not, as was afterwards proved by analysis. During the two months I attended her I gave her 11½ grains of mercurial preparation; I prescribed bismuth in 10-grain doses, three times a day, for eight days."

Mr. J. M. Cardell, Surgeon, Salisbury, deposed:—"It is possible the tumour might cause sickness, but not such as to cause death. I don't say it is a scirrhous tumour. In the state in which it was found it might have caused sickness, but not fatal sickness."

Dr. Harley, of Harley Street, London, deposed:—"I received from the hands of the Coroner a sealed jar, containing portions of the brain, lungs, œsophagus, spleen, pancreas, rectum, and two kidneys. The chemical analysis showed the following results:—First, the contents of the rectum, together with the fluid found in the jar, were tested for poison under Reinsch's process. A grey metallic film was deposited on the copper, but the quantity was too small to admit of its true nature being ascertained. Second, the kidneys and spleen yielded, by Reinsch's process, a grey metallic film; but, as in the above case, of a quantity insufficient to allow of its true nature to be ascertained. Third, the kidneys and spleen were next treated by the distillation process. The first and second distillates were tested with the ammonio-nitrate of silver, and with the ammonio-sulphate of copper, and yielded doubtful evidence of arsenic, a faint coloration only being obtained. Fourth, the kidneys and spleen were now treated by the incineration process. The acidulated aqueous extract yielded a yellow, slightly orange-coloured precipitate with sulphuretted hydrogen, which, when further tested with sulphide of ammonium, and afterwards with acids, gave the reactions of arsenic, and doubtful evidence of antimony. By Marsh's process a negative result was obtained. Fifth, the brain, pancreas, and portions of the intestines, with the exception of the lower part of the rectum, which has been preserved as a pathological specimen, were also tested by Reinsch's process, with a result precisely similar to that obtained by the same means from the kidneys, as stated in analysis No. 2. Sixth, the brain, pancreas, and portions of the intestinal tube were subjected to the incineration process, and yielded a very small quantity of an orange-yellow precipitate on the addition of the sulphuretted hydrogen test. When the said precipitate was prepared and tested by Marsh's process, a negative result was obtained. It is highly probable that arsenic, and possible that antimony were present in minute quantity in the contents of the sealed jar received by me from Mr. Wilson the Coroner. The result of the whole is, that there are traces of arsenic in the kidneys and spleen, but not sufficient to give a decided opinion of poison."

Dr. Roberts, of Salisbury, deposed:—"My reasons for not suspecting the presence of virulent poisons are:—Had there been acute inflammation by irritant poison, there would have been symptoms of it during life. There would have been tenderness of the stomach, purging, and pain on pressure of the intestines. There was not a trace of the usual symptoms of poisoning. The only pain she complained of was after eating; as long as she did not attempt to take food or drink, she was in comparative ease. The absence of these symptoms are, I think, conclusive that she did not die by arsenic."

The jury returned a verdict—"That the medical evidence proved that the deceased Ann Kiddle died from the effects of irritant poison, but by whom it was administered there is no evidence to show."

I have here laid before the readers of this Journal a summary of the principal points of the evidence given in this remarkable case of poisoning, from which it will be observed that Drs. Shettle, Harley, and Herapath, and Mr. Cardell, were decidedly of opinion that death was caused by an irritant poison,

and that the scirrhous tumour was not sufficient to cause death. While on the other side, Dr. Roberts was of opinion that she did not die from arsenic, but from the scirrhous tumour, which, in his opinion, was more than sufficient to account for the symptoms, and cause death.

On a careful and impartial examination of the chemical evidence laid before the magistrates, the following facts will be found to stand boldly forward:—

1st. That Dr. Herapath found in portions only of the stomach and intestines the greater part of one grain of arsenic; that he actually weighed four-fifths of a grain; and that he also found bismuth, silver, copper, and antimony; the copper and antimony were mere traces, but the bismuth was in larger quantity.

2nd. That he also found in the bile distinct traces of arsenic, and in the liver a very large quantity of a mixture of arsenic, silver, and mercury, none of which was estimated. And the various metals found were produced in Court for the examination of the magistrates.

3rd. That no arsenic was found in Dr. Shettle's drugs.

4th. The tests employed were those used by every scientific chemist, and their purity had previously been established.

I will next proceed to sum up the principal points of the chemical evidence as given before the Coroner by Dr. Harley.

1st. The contents of the rectum by Reinsch's process, and the kidneys and spleen by both Reinsch's and the distillation processes, yielded doubtful evidence of arsenic.

2nd. The kidneys and spleen, treated by the incineration process, yielded plain proofs of the presence of arsenic.

3rd. The brain, pancreas, and part of the intestinal tube yielded, by Marsh's process, doubtful evidence of arsenic.

4th. The brain, pancreas, and portions of the intestines, submitted to the incineration process, yielded traces of arsenic.

In the face of the chemical evidence of Drs. Herapath and Harley, the impartial, unbiassed reader can come to no other conclusion than that of the jury, viz. *that Ann Kiddle died from the effects of irritant poison.*

After both judicial inquiries had terminated, various letters appeared in the 'Salisbury Journal,' all tending to throw doubt and discredit on the medical and chemical evidence upon which the jury found their verdict. In one of these letters, amongst other things, an attempt is made to prove that the trisnitrate of bismuth administered to the deceased was contaminated with arsenic; and hence, the source of the arsenic discovered, the whole case of poisoning falls to the ground. But the absurdity of this line of reasoning will be rendered apparent from the following facts:—Dr. Shettle administered only 180 grains of trisnitrate of bismuth, and this was proved to have been free from arsenic on being tested according to Rose's method; consequently, this source of the arsenic vanishes entirely. Something was also stated about bismuth having been ordered for her by Dr. Roberts on August 25th, but no proof was given either as to the quantity or purity of the bismuth so ordered, and this fact therefore must be allowed to have no weight whatever. For aught we know this bismuth may have been absolutely pure, as some of the samples positively are.

For the sake of discussion, let us take another point of view of this "bismuth question." Let us admit an impure trisnitrate of bismuth to have been taken, allowing it to be as impure as the worst sample out of twenty analyzed by Dr. Herapath,—that is, containing 1 grain of arsenious acid in 433 of bismuth, and even then where does the arsenic come from? 346 *grains of the most impure trisnitrate of bismuth must have been taken to account only for the arsenic actually weighed in the scale,* to say nothing of the arsenic found in

the liver and some portions of the intestines not estimated. And in order for this 346 grains of impure trisnitrate of bismuth to account at all for the arsenic found, we must invent a special theory; we must allow the stomach to have the most marvellous and mysterious power, opposed alike to common sense, experience, and science, of separating, time after time, the whole of the arsenic from the bismuth administered; in fact, of separating $\frac{1}{43}$rd of a grain of arsenic from each dose of the bismuth, and of storing it up, no elimination whatever taking place, neither by the fæces, urine, or vomiting.

We now come to another, and it must be confessed a very difficult point, as regards this theory of accounting for the poison, admitting as before, for the sake of argument, that an impure bismuth was administered. How is it that all, or nearly all, of the bismuth was in this case evacuated and the arsenic retained? If the arsenical impurity were merely a mechanical admixture, it would perhaps be reasonable to suppose the stomach capable of absorbing it, although not of storing it up; but unfortunately for this theory *the arsenic is not present in a free state, but in the form of a definite chemical compound, arsenite of bismuth, which is as insoluble as the trisnitrate of bismuth itself, and is, without the least doubt, eliminated from the system in the same manner.* In conclusion, although the stomach has certainly great powers, there is no known evidence proving it to have the powers necessary for this theory to be reasonable, or worth more than the paper it is written on.

Wilton, near Salisbury, March 16.

TO PARENTS AND GUARDIANS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—It is no small gratification to know that "every black cloud has its silver lining." Fortunate indeed is it that such is the case, as those parents and guardians who read the address of Mr. Joseph Ince will imagine (we think) that he has drawn a somewhat dark, and not over-pleasing picture. We cannot help thinking it to be a little *too* "one-sided," and rather overdrawn; he has evidently forgotten to put in those nice little touches which mellow down the background, and cause it to send out what appears to be a ray of sunlight across the otherwise drear and icy landscape.

In this age of progress we are continually called upon to witness "new developments," alike in the "mental" as in the "physical" constitution of things, and as such is indisputably the case, our aim should be to stir up a spirit of emulation, and not to scatter the icicles of discouragement.

The remarks thrown out by Mr. Ince (with the best intentions we doubt not) are not calculated to encourage, nor is it at all improbable *they may mislead.*

The sins of ignorance, and the follies of indiscretion spoken of, apply more to the past than the present; and whilst they may serve as "finger-posts" to point future aspirants to the better and nobler pathway which leads to renown, they should not be hung out as "black flags" to frighten the timid.

The question which the parent or guardian has to decide, is *not* what "I wish my boy to be,"—*but,* "*what is he fit for?*" and thus, by a careful watching of the bent of the youth's inclination, it will not be a difficult matter to decide what he is best fitted for. It is a mistake to suppose that those will be the most successful who have the best prospects in a pecuniary point of view; experience does not bear this out, as it too often happens that students, who are well bolstered up by *means,* too often waste precious time, and find themselves left behind by their less favoured, but more studious comrades.

Your correspondent calls particular attention to "certain facts;" these we dispute not,—"as facts"—but with the deductions we do not agree.

It is the testimony of no few, we are told, "that had they known the consequences entailed upon their calling, they would never have chosen it." This is an argument which militates not one whit against pharmacy; it is a complaint common to every career in life, and proves only the truthfulness of the old saying, "there is a crook in every man's lot," and wherever man is found, there will you find a grumbler.

The illustration so playfully worked by Mr. Ince of the Napoleon of the "herb and berry" trade, the little silver bolt of whose machinery struck the fatal blow and left him dead, although intended to have an opposite effect, bears out our own idea of what a man "ought" to be—alive to everything which "lawfully" concerns his calling; and we quite agree with your correspondent, that his abilities could have found no possible development within the four walls of a druggist's shop, and for that very reason he never had one. The bent of his mind was in another direction. In his case success in trade was due to "the man," and but for his judgment, energy, and push, he might, instead of falling senseless at the feet of wealth, have found a pauper's grave.

Now here is a pattern for the young aspirant druggist: his mind, his energies, his judgment, yea, and his *push* too (for every man must "push forward"), should be directed to the one great object "success," determined that whatever he does, he will *do well*. In his last illustration your correspondent has borrowed the "poet's licence."

This certain reverend divine who was accustomed to buy his sermons ready-made, was evidently a "blockhead," and it would have been quite as well if he had not been introduced here, as the inference drawn from his appearance casts a somewhat unfortunate slur upon some who are already in full swing. It implies that he who does not manufacture "*per se*," is as likely to cull from the "wrong bin" as the right one,—an inference which is not strictly correct.

That many a sad and fatal mistake has been made in pressing youth into the business of a chemist and druggist without sufficient thought or qualification, is a fact we would not question; at the same time, we are not unmindful of a fact equally potent, and it is this:—the youth who starts having large expectations at the end of his apprentice term, is rarely found to make such good use of his early opportunities, or to be as patient in gathering up that necessary sound *practical experience* so essential to a successful and clever man of business, as the one who is thrown more upon his own resources, and left to dig out a foundation for himself, and raise his own superstructure by industry and skill.

Ignorance is less likely to run rampant in the future than it was in the past; there exists a deeper public discrimination, as well as a growing desire for knowledge, which in bygone days was not felt; and hence there exists a greater probability that the "stain" will eventually be entirely wiped out.

Meanwhile, let us not be found making "mountains out of molehills," or crying wolf when no wolf is near, lest we drive away some hopeful one from the wide opening to renown.

Parents and guardians who bestow a sound and liberal education upon those entrusted to their care, will not have much to fear, even though their youth should exhibit a desire for the Æsculapian line, when there is not such an amount of capital as some are disposed to think necessary to success, as industry and skill always bring their own reward.

G. G. Hornsby.

Cheltenham, March 18, 1863.

ON BERBERINE—CONTRIBUTIONS TO ITS HISTORY AND REVISION OF ITS FORMULA.

BY J. DYSON PERRINS, F.C.S.

The objects of this paper are to announce some new sources for the alkaloid Berberine, to describe several of its salts hitherto unnoticed, and to review the formula proposed by Fleitmann.

The chemical history of berberine is somewhat remarkable, and it will not be out of place here to refer briefly to it. The first notice of this body has hitherto been attributed to Buchner and Herberger, who discovered it in *Berberis vulgaris*, in 1835. They erroneously regarded it as a weak acid, rather than as a powerful organic base, and Buchner's formula has long been abandoned. I find however that Chevallier and Pelletan deserve honourable mention as being the first observers of berberine; they accurately described it under the name of Zanthopicrite in 1826. More recently Fleitmann* published an account of "Berberine and some of its Salts," clearly establishing its basic character, and propounding a formula replacing that which had resulted from the previous labours of Buchner. Fleitmann's formula has obtained general acceptance,† varied however by Gerhardt, who, on theoretical grounds, proposed the addition of a single equivalent each, of hydrogen and oxygen. In addition to many of the *Berberideæ*, various other sources for this alkaloid, so remarkable for its beautiful yellow colour, have been discovered—by Boedeker‡ in *Cocculus palmatus*, the calumba root of pharmacy, belonging to the natural order *Menispermaceæ;* by Stenhouse§ in *Cœlocline polycarpa*, natural order *Anonaceæ*, an African wood from Sierra Leone; by myself‖ in *Coscinium fenestratum*, natural order *Menispermaceæ*, a root from Ceylon; by myself¶ also in *Xanthorriza apiifolia*, natural order *Ranunculaceæ*, a North American plant; by Mahla** in *Hydrastis Canadensis*, another of the *Ranunculaceæ*, also a North American plant, common in the United States, the rhizome of which is used in American pharmacy.

Some time before the publication of Mahla's Paper, I had noticed the occurrence of berberine in *H. Canadensis;* indeed it was through that observation that I was led to make the present inquiry.

I can recommend *H. Canadensis*, which may be readily obtained in this country, as an excellent and available source for berberine; it yields about four per cent. of the crude alkaloid.

In addition to the sources already named, I have now to announce the following new ones: it seems unnecessary to describe the methods employed to isolate the alkaloid—they were always founded upon its solubility in alcohol and the sparing solubility of the nitrate in solutions acidulated with nitric acid.

In the Indian Museum there is a yellow dye-wood from Upper Assam, called by the native name *Woodunpar;* of this I obtained a specimen through the courtesy of Dr. J. Forbes Watson; I find that berberine constitutes its yellow-colouring principle. I regret that I have been unable to ascertain the proper botanical name; from its structure it properly belongs to the order *Menispermaceæ*.

A woody root called *Raiz de São João*, or St. John's root, from Rio Grande, I believe twice imported into this country, and of which a specimen has been kindly given to me by Daniel Hanbury, Esq., F.L.S., etc., abounds in berberine; in this instance also I am unable to give the botanical designation. I gladly avail myself of this opportunity of expressing my sense of the kind assistance I have received from my friend Mr. Hanbury in the course of this inquiry. Amongst numerous rare specimens this gentleman has favoured me with, is a yellow bark from the Botanical Museum at Kew, of which little appears to be known; it is simply named "*Pachnelo* tree—*yellow*

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* Chem. Gaz., 1847, vol. v. p. 129; Ann. Ch. Pharm., lix. 60.

† Except by Kemp, *vide* Chem. Gaz., v. 5, p. 209, who proposed a formula which has found no support; his platinum determinations agree with Fleitmann's and my own, but most unaccountably his carbon determinations of the platinum-salt are about two per cent. higher than those of any other chemist before or since.

‡ Chem. Gaz., vol. vi. p. 302.

§ Pharm. Journ. Trans., 1855, vol. xiv. p. 455.

‖ Phil. Mag. [4] iv. 99.

¶ Pharm. Journ. Trans., 1862, vol. iii. p. 567.

** Silliman's Journal, 1862, vol. xxxiii. p. 43.

dye—Bogotá." This bark I find to be very rich in berberine, of which it yielded nearly seven per cent. of its weight. If further inquiry should show that pachnelo-trees are plentiful in New Granada or other districts in South America, a most valuable source for berberine will be secured.

The next source for this alkaloid which I have to announce is one of considerable interest: it is the root of *Coptis Teeta* or *Mahmira*, a Ranunculaceous plant of Hindostan and China, highly prized on account of its tonic properties, and known in the bazaars of India as *Mishmee bitter*. There is an historical notice of this root from the pen of the late Dr. Pereira.* He regards as probable that *Coptis Teeta* is a remedy of great antiquity—in fact, a classical medicine, used in ancient Greece, and described by certain Greek and Arabian authors; in more recent times known in Europe under another name, but its origin not suspected. The first accurate notice of the root by any modern writer was given by Dr. Wallich, from whose account I quote:—"Mishme Teeta is the name by which the drug is designated among the Mishmees and Lamas in the mountainous regions bordering upon Upper Assam. The Chinese call it *Hong-lane;* among these three nations it is in great estimation and universal use as a powerful tonic and stomachic. Quantities are sent down to Assam in neat little baskets, with open meshes made of narrow slips of rattan or some such material, and measuring three to four inches in length by two and a half in breadth. Each basket contains about an ounce of small pieces of the root from one to three inches long; they are nearly cylindric, uneven, scabrous, more or less curved, of a greyish-brown colour, and varying in thickness from the size of a crow-quill to double that diameter. The root is perfectly dry and brittle; occasionally a few fibrillæ are issuing from one end; the inside is hard, somewhat cellular, the outside of a dingy yellow colour. The taste is intensely and purely bitter, very lasting, and with only a very slight aroma. On mastication, the root tinges the saliva yellow or gold-coloured; it possesses no smell whatever."

This account well describes a quantity of the root which I received from the East India Museum, through the kindness of Dr. J. Forbes Watson. I soon ascertained that the active principle of *Coptis Teeta* is berberine, in which the root abounds. I obtained from it eight and a half per cent., which is the largest amount yet met with, nor will it probably ever be surpassed. I did not obtain any other crystalline substance from this root.

Lastly, I have succeeded in establishing the fact that Zanthopicrite, obtained from *Zanthoxylum Clava-Herculis*, by Chevallier and Pelletan,† in 1826, is no other substance than berberine, and that consequently they must be considered as the first observers of this body.‡ My friend Mr. Hanbury again assisted my inquiry, by furnishing me with some of the bark of *Z. Clava-Herculis*. According to Dr. Julius Martiny, a German pharmacologist of eminence, this bark is somewhat peculiar, from its highly laminated texture, splitting readily into thin plates like garden bast; this is noticed by the French authors, and altogether the careful description they give exactly applies to the bark which I have examined. The botanical synonyms are *Z. Clava-Herculis*, Linn.; *Z. Carolinianum*, Gaertner; and *Z. Caribæum*, Lamarck. It is quite necessary to particularize this, in order to prevent the confusion consequent upon the

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* Pharm. Journ. Trans., 1851, vol. xi. p. 294.

† Journ. de Chimie Med., 1826, vol. ii. 314: Note sur le *Zanthoxylum des Caraibes* ou *Clavalier des Antilles*, par MM. Chevallier et Gabriel Pelletan. This bark is used in the West Indies as a febrifuge.

‡ *Note by Professor Bentley.*—In a paper published in the March number of the 'Pharmaceutical Journal,' I stated that the peculiar crystallizable principle found by Dr. Staples in the bark of *Xanthoxylon fraxineum*, and termed by him *xanthoxyline*, had been commonly regarded as identical with the bitter crystalline principle *xanthopicrite*, discovered by Chevallier and Pelletan in the bark of another species of *Xanthoxylon;* and as Mr. Perrins had proved the identity of the latter principle with berberine, I was led to infer, naturally, that xanthoxyline and berberine were also identical. Mr. Perrins, who is so well known for his researches on berberine, has since written to inform me that xanthoxyline and xanthopicrite are "totally distinct," and that xanthoxyline "has no resemblance whatever to berberine." Mr. Perrins also states that he could find no berberine in the bark of *Xanthoxylon fraxineum*.

last-named botanist applying the specific term *Z. Clava-Herculis* to a tree which is totally distinct.

The French chemists do not appear to have attempted the ultimate analysis of their zanthopicrite, but they have carefully noted several of its properties and reactions, not omitting the somewhat unusual deportment of this body with sulphide of potassium. My own results have clearly proved the identity of zanthopicrite and berberine. *Z. Clava-Herculis* belongs to the natural order *Rutaceæ*, and furnishes the first recorded example of berberine being a product of any plant of that order.

I now proceed to detail the numerical results I have obtained. It seems unnecessary to state in each case from which plant I have prepared the salt for analysis; suffice it to say, that the whole of the sources now first announced are included.

It is not without some hesitation that I allow myself to question the conclusions of chemists of the eminence of Fleitmann, Boedeker, and others; but my own results are so accordant with each other, the number of analyses I have made, and the variety of combinations I have examined, are so considerable, that I feel not only justified in proposing an alteration of the formula, but indeed compelled to do so. Perhaps my hesitation is lessened by the recollection that, on a former occasion, I acquiesced in Fleitmann's formula, and even supposed that it was confirmed by my analysis of the hydrochlorate, and by a platinum determination; but later experience has shown me that the hydrochlorate is not suited for ultimate analysis, as by pretty long exposure to a temperature of 100° C., or thereabouts, it undergoes some decomposition, the colour changes permanently, and much of it becomes readily soluble in cold water, yielding a red solution; in these respects it differs from the undried salt, thus proving that some alteration by heat has taken place. The pure alkaloid itself is equally unsuited for analysis, and for similar reasons, indeed I find it not easily prepared in a state of purity. With regard to the platinum determinations of some previous chemists, it is evident that impure products have been examined. I find that very many crystallizations are necessary before any of the salts of berberine can be pronounced pure. I must also state that the numerical results of Fleitmann agree with mine in many cases, and support the formula I propose rather than his own.

Fleitmann's formula is $C_{42}H_{18}NO_9$.* A glance at these numbers will suggest great doubts of their accuracy, the number of oxygen equivalents, and the sum of those of hydrogen and nitrogen, being indivisible by two; Gerhardt observed this, and proposed to represent berberine by $C_{42}H_{19}NO_{10}$? His alteration has the effect of increasing the atomic weight, which my results point out as being already too high. The formula I propose is $C_{40}H_{17}NO_8$, which, with Gerhardt's, is equally free from theoretical objection, and I hope to show that it is fully borne out by abundant analytical proof.

As the platinum salt possesses many advantages for determining the composition of the alkaloid, I have from time to time examined it. It may be prepared with ease in a pure state, in consequence of its great insolubility; like every other combination of berberine, it may be obtained in minute crystalline needles by precipitating a hot dilute solution of any berberine salt with bichloride of platinum. When collected, the precipitate should be washed with cold water until the washings, upon the addition of iodide of potassium, give no evidence of the presence of platinum; it may then be dried at once in the water-oven without any fear of decomposition, and it burns without difficulty.

The author gives the results of several analyses of Chloroplatinate of Berberine leading to the formula $C_{40}H_{17}NO_8HCl.PtCl_2$.

Chloroaurate of Berberine.

This combination was examined as possessing an advantage even over the platinum-salt for the object in view, owing to the high combining weight of gold.

On adding terchloride of gold to the hydrochlorate or other salt of berberine, the double gold-salt immediately falls as an amorphous brown-coloured precipitate, quite insoluble in water; it is purified for analysis by washing with water, and dissolving in boiling dilute spirit, from which it crystallizes on cooling in chestnut-brown needles, which may be dried at 100° C. without decomposition; it burns without difficulty.

* C = 6, O = 8; for the sake of comparison, these values will be retained through this paper.

Analysis gave results leading to the following formula :—$C_{40}H_{17}NO_8.HCl.AuCl_3$,

The next combination to be described is interesting, as belonging to a class that I do not remember to have seen noticed before—viz., the double hyposulphites of silver and the alkaloids.

Hyposulphite of Berberine and Silver is precipitated in a yellow amorphous pulverulent form, when to a cold neutral solution of a salt of berberine is added hyposulphite of soda, saturated, or nearly so, with any silver-salt. The precipitant may be prepared by adding nitrate of silver to solution of hyposulphite of soda, so long as the precipitate first formed is redissolved; it must be filtered and used while fresh, as in time the silver is gradually deposited as sulphide.

The double berberine-salt is insoluble in water, but readily so in spirit, and in solution of hyposulphite of soda; it is decomposed by ebullition, with separation of sulphide of silver. To prepare the salt for analysis, I add the argentine solution to nitrate of berberine dissolved in weak spirit, while hot; the double salt crystallizes out on cooling in minute prisms of a pure lemon-yellow colour; they are readily washed with water, and the air-dried salt does not decompose or alter in colour at 100° C. Upon careful and prolonged ignition, nothing is left but perfectly white metallic silver.

The analysis of this salt leads to the formula $C_{40}H_{17}NO_8,HO.S_2O_2,AgO.S_2O_2$.

Bichromate of Berberine.—This salt has been described by Fleitmann as an amorphous substance. I have to remark that it may be obtained in orange-yellow needles by adding bichromate of potassium to a boiling and very dilute solution of a salt of berberine—the crystals separate entirely on cooling. This salt is extremely insoluble in excess of the precipitant and in cold water, but it may be recrystallized from a large quantity of hot water. It burns readily, and the green oxide of chromium may thus be determined with exactitude. This salt agrees in constitution with the bichromates of ammonia, lepidine, chinoline, etc., in containing only one atom of water.

The following formula is deduced from the analysis :—$C_{40}H_{17}NO_8HO,2CrO_3$,

The following salts were also submitted to analysis, and the formulæ given deduced therefrom :—

Nitrate of Berberine, $C_{40}H_{17}NO_8.HNO_6$,
Hydrobromate of Berberine, $C_{40}H_{17}NO_8.HBr.3aq$.
Hydriodate of Berberine, $C_{40}H_{17}NO_8.HI$.

I have now to describe a remarkable compound of iodine with berberine, having certain analogies with the quinine-salt termed herapathite. When dilute solution of iodine in iodide of potassium is added to solution of any salt of berberine in hot spirit, *carefully avoiding an excess of iodine*, the new substance speedily makes its appearance in the form of brilliant green spangles, which increase in quantity as the solution cools; they are invariably accompanied by crystals of hydriodate of berberine, or by the red salt last described, nor have I been able to devise any method of preparation by which this admixture can be wholly prevented. The formation of this new body is an excellent test for the presence of berberine; minute quantities may be detected by this reaction. Its occurrence seems to be determined whenever tincture of iodine containing hydriodic acid is added to solution of any salt of berberine in hot weak spirit, scrupulously avoiding excess of iodine; rapid agitation appears to promote its formation, and the presence of any impurity to interfere with it. Like herapathite, it bears a strong resemblance to particles of the elytra of cantharides, and to murexide; under the microscope it is seen to consist of crystals of a variety of forms, but I believe all derived from a rhombic prism; the larger crystals are wholly opaque; many of the smaller ones however are sufficiently thin to allow of the passage of light, which assumes a red-brown hue, sometimes inclining to violet; but the light is perfectly polarized, in this respect also resembling herapathite, with which its optical properties are obviously similar.

I obtained this compound with the smallest admixture of hydriodate, and in the largest crystals, by heating in a strong bottle, solution of berberine in alcohol of 90 per cent., with addition of iodide of ethyl, to 100° C.; upon cooling, the bottle contains crystals of hydriodate of berberine, but if exposed to full sunshine for one or two hours, the crystals pass into the green salt now under notice. When the change appears to be complete, the bottle must be removed from the sunshine, or else the

crystals will further pass into the red iodine-salt last described. Exposure to diffused daylight for some days may be substituted for sunshine; but, with every precaution, I have not been able to obtain the substance free from foreign crystals. It is not easy to see why this iodide of ethyl process succeeds better than others; probably the gradual development of free iodine is important. By this method I have obtained crystalline plates one-fifth of an inch in length, by about half that breadth—of course, perfectly opaque. When removed from the solution, and well washed with weak spirit, to remove adhering iodine, they have a blackish-green colour with a fine metallic lustre, yielding a nearly black powder, which does not decompose at 100° C.

Berberine evidently occupies a position among the vegetal alkaloids of great interest in a scientific point of view—a position far more prominent than has hitherto been assigned to it; if noticed at all in our manuals, it is dismissed in half-a-dozen lines. From inquiries, which can be termed little more than superficial, its occurrence has been shown in numerous plants, belonging to no less than five of the great vegetal families,—the natural orders of the botanist,—nor can it be doubted that many other sources yet remain to be discovered; its geographical distribution, even in the present state of our knowledge, is all but universal; it is to be found in almost every country, certainly in every climate, and in these respects it claims precedence over all the other alkaloids.

As regards its usefulness to man, I believe its importance is not yet fully recognized. Though it has been long used as a fine yellow dye, more especially for animal tissues, its chief claims to usefulness do not reside in its application to the economic arts—doubtless its therapeutic effects merit much careful investigation. Natural instinct has pointed out its value, for the alleviation of human suffering, to nations widely separated and enjoying different degrees of civilization. The polished Greeks, the semi-barbarous nations of Hindostan and China, the North American Indians, and the natives of tropical Africa, have been all impressed with the medicinal value of berberine. In the West India Islands and in American pharmacy its virtues have long been recognized, though derived from different plants, and veiled under erroneous names; certainly, it holds a place in European pharmacy but one of little prominence, yet it seems to possess properties scarcely inferior to quinine itself. Various medical writers have insisted upon its advantages as a remedial agent; their arguments it would be out of place here to recapitulate, but I am persuaded that nature has not placed berberine in nearly every country without some adequate purpose; there are evidences that its value is becoming better understood amongst ourselves, and I confidently anticipate that ere long its reputation will be greatly increased.—*Abridged from the Journal of the Chemical Society.*

ON FERMENTATION AS A CAUSE OF VARIOUS DISEASES.

BY M. POLLI.

M. Polli, of Milan, has recently published two very interesting memoirs on fermentation as a cause of various diseases, from which we extract some of the more important facts.

Chemists who have, of late years, investigated with the greatest success the phenomena of fermentation, have observed that this mode of reaction amongst organic principles has a much greater importance than was suspected. It is, in fact, to fermentation that the spontaneous decomposition of animal and vegetable tissues is due, such as gangrene, dry-rot, eremacausis, etc., and the whole series of successive transformations that organic substances undergo until they are converted into water, carbonic acid, ammonia, and mineral matters. It is by fermentation that fatty bodies give glycerine; that salicine furnishes glucose; that myronate of potash is converted into essential oil of mustard; that neutral substances, such as urea and allantoin, form ammonia; that amygdaline produces the poisonous substances, oil of bitter almonds and hydrocyanic acid.

Ferments act by contact or by catalysis. Sometimes they are living creatures, sometimes very active substances which are not organized. Diastase, emulsine, and pepsine perform the part of ferments. They may cause organic substances to double, become hydrated, or isomeric.

According to M. Polli, there exists a great analogy between the processes of fermentation and many organic metamorphoses which occur in some diseases. An albuminous matter which in a particular state of alteration acts as a ferment, and particular substances which proceed from its action, this is the basis of the humoral theory.*

But analogy is not sufficient of itself; it has been shown by carefully conducted experiments that the blood in disease undergoes alterations and variations in its composition, and that artificial disease may be produced bearing a strong resemblance to natural disease, by injecting into the blood-vessels substances which act as ferments. Multiple abscesses, induced by the injection of pus into the veins of dogs; septic affections caused by injecting purulent putrid matters into the veins of animals; diseases presenting all the characteristics of typhoid fever, and caused by the injection of putrefied blood into the circulating current; finally, contagious diseases, such as glanders, which is produced by the injection of glanderous humours, are facts which prove that a general affection may be induced by the simple introduction into the blood of a substance capable of acting as a ferment. The diseases which may be called catalytic, in which the morbific matter produces metamorphoses by contact with the alterable principles of the blood, are the primary cause of all the symptoms presented by the animal economy. In short, it is impossible to deny that fermentation may be produced in the blood.

But admitting that the starting-point of many diseases is the action of a specific ferment in the blood, is it possible to prevent its effects, to render it inactive in the living organism, as we may do apart from the body, by many chemical means? This is the great point which gives interest to this pathological question.

M. Polli believes that he has proved by a series of facts and conclusive experiments, that it is possible to neutralize morbific ferments in the blood of animals by chemical substances which do not act in a manner incompatible with life; and it is by these substances that we must hope to treat successfully those diseases, of which fermentation is the primary cause.

It is well known that sulphurous acid gas prevents alcoholic and acetic fermentation, and also the fermentation of animal substances and organic matters in general. Thus it arrests, if it be already begun, the fermentation produced by saliva and diastase in contact with starch, the fermentation which myrosine induces in the paste of black mustard flour, that which is produced by emulsine on the amygdaline of bitter almonds, etc.

M. Polli has proved that alkaline or earthy sulphites possess the same antiseptic and decolorizing properties. This is a very important fact, since it admits of the application of sulphurous acid in therapeutics. He thinks also that he has ascertained that the action of sulphurous acid and of sulphites on colouring matters, as well as on ferments, is neither a deoxygenation, a combination, nor a destruction, but simply a molecular modification.

This mode of action of sulphurous acid and sulphites explains the valuable property which these chemical compounds possess of preventing or energetically arresting the action of morbific ferments artificially introduced into the blood of animals, without altering its composition in such a manner as to be incompatible with life.

From a great number of experiments made upon dogs and alluded to in his memoirs, M. Polli has determined the safe and efficacious dose of sulphites for internal administration, the changes which they undergo in the organization, and their curative action in the affections produced by the injection of putrid or contagious matters into the blood.

The following are some of his experiments, selected from those of the last-mentioned series:—

1. Ten grammes of sulphite of soda were given to a dog during a period of five days, then one gramme of pus was injected into the femoral vein. The animal became dull, and refused the food which it was offered, but the next day its spirits returned and it

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* According to M. Pasteur, ferment is not albuminous matter altered by oxygen, but an organized being, the germ of which is brought by the air. The presence of albuminous matters is an indispensable condition of all fermentations, because such substances are necessary to the production of the ferment.

ate willingly. Two days after, the same experiment was repeated and was followed by the same results. At the end of a few days the animal was perfectly cured.

2. One grammme of pus was injected in two portions into the veins of a dog, of a more robust nature than that operated upon in the preceding experiment. The animal became spiritless, but the next day took some food; the following day it was very low, it breathed with difficulty, its wounds were sanious, its left leg and foot swollen, and it died ten days afterwards.

3. An equal quantity of putrid blood was injected into the veins of three dogs; one died five hours after the infection, another after five days of illness, and the third, to which some sulphite of soda had been administered, after having experienced some trifling symptoms of illness, rapidly recovered.

4. Numerous other experiments made with putrid blood and morbific mucus proved that the animals died with all the symptoms of a general infection, whenever sulphite of soda was not administered, and that, on the contrary, they speedily recovered, under its influence.*

If these facts should be confirmed by other experiments, M. Polli will have rendered an inestimable service to therapeutics, and will have thrown some light on the yet obscure cause of numerous diseases.—*Journal de Pharmacie et de Chimie.*

ON THE DETECTION OF CANTHARIDINE.

BY C. R. C. TICHBORNE, ESQ.

Some time since I was called upon to examine some brandy which was suspected to have been tampered with for aphrodisiac purposes, the symptoms indicating cantharides. The suspected fluid was the remains of a glass of brandy-punch sweetened with sugar. It was quite bright and free from any *débris* of the flies. Now, if the flies themselves had been used, it is next to impossible that every particle of the elytræ would escape detection by the aid of the microscope; but in such a case as that given above this conclusive test would of course be wanting. Desirous of investigating the subject, I performed some experiments which proved satisfactorily to myself the ease with which small quantities of cantharidine in solution can be detected, even when mixed with large quantities of foreign extractive matter. The only process given by Taylor for the detection of cantharides is to evaporate to dryness, extract with ether, and to dry the vesicating properties of the ethereal extract after evaporation. Taylor then goes on to say, that "this mode of testing is somewhat uncertain, unless the quantity be large. . . . There is, however, no other mode of discovering cantharides in solution, whether as tincture or infusion, than this."† I also found this process very unsatisfactory, which is probably due to the loss of the cantharidine, when occurring in small quantities, from the employment of heat. The chemical tests for cantharidine are too vague to admit of application, therefore we would naturally look to its vesicating properties as the best indication of its presence. The *modus operandi* that I pursued I now give, and it is extraordinary how small a quantity of poison can be detected with certainty if the details are strictly complied with.

Chloroform is the best solvent of cantharidine that we have, and I should recommend its employment for the extraction. In the experiments above referred to, a tincture was used that represented three grains of cantharides. This was added to half a pint of wine,‡ and to this, which represented a suspected fluid, was added one ounce of chloroform. The whole was repeatedly shaken during the day, and left to subside until next morning. The chloroform was then carefully separated with a funnel and passed through bibulous paper. The chloroformic solution was then allowed to evaporate spontaneously to dryness in a watch-glass. A small pellet of lint (which had previously been teased out), about half the size of a pea, was moistened with a drop of olive oil, and with this little pellet the whole of the film of extractive matter was

* For a notice of the sulphites tried by Professor Polli, see the current volume of the 'Pharmaceutical Journal,' p. 37. The above more detailed account of M. Polli's memoirs has been in type for some time, but its publication has been hitherto deferred from press of matter.—Ed. Ph. J.

† Taylor on Poisons, page 546.

‡ In a second experiment it was added to half a pint of porter.

mopped off the watch-glass. The lint was then placed upon the arm, and covered with a piece of gold-beater's skin. When taken off in three or four hours considerable rubefaction had taken place, and after wiping it off with chloroform a large vesicle was formed. As small a quantity as one grain of flies (= about 4-1000ths of a grain of cantharidine) was detected in solution by this means. To look for less than this in a medico-legal investigation would be useless, as this is much under a medicinal dose. The smallest dose of the tincture which has been known to destroy life was an ounce, = 6 grains of powdered cantharides. In an investigation of the kind our object is to concentrate the active principle, which is diffused through an extensive medium, and to bring it to bear upon a limited surface; or, in other words, to bring it to a focus. Of course, in such a manipulation, where there is so small a quantity of the principle, and which principle is in so diluted a form, it requires to be done with the greatest care, in order to avoid loss, and to get it as free as possible from foreign matter, which might seriously diminish its activity.—*Dublin Medical Press.*

POISONS NOT ALWAYS POISONS.

The following, from 'Sketches of the Natural History of Ceylon,' by Sir J. Emerson Tennent, forms an interesting note to Mr. Attfield's paper on this subject. (See Vol. III., 2nd series, page 453.)

"The hornbill is also frugivorous, and the natives assert that when endeavouring to detach a fruit, if the stem be too tough to be severed by his mandibles, he flings himself off the branch so as to add the weight of his body to the pressure of his beak. The hornbill abounds in Cuttack, and bears there the name of *Kuchilakai*, or Kuchilla-eater, from its partiality for the fruit of the *Strychnos Nux-vomica*. The natives regard its flesh as a sovereign specific for rheumatic affections." (Asiat. Res., ch. xv. p. 184.) Referring to the mongoos and their not being liable to be hurt by poisonous serpents, the author says, "Such exceptional provisions are not without precedent in the animal economy; the hornbill feeds with impunity on the deadly fruit of the strychnos; the milky juice of some species of euphorbia, which is harmless to oxen, is invariably fatal to the zebra; and the tsetse fly, the pest of South Africa, whose bite is mortal to the ox, the dog, and the horse, is harmless to man and the untamed creatures of the forest."

PREPARATION OF PURE PEPSINE.

BY M. BRUCKE.

Pepsine may be precipitated from its solution by agitation with cholesterine, phosphate of lime, or even animal charcoal; dissolved in water containing phosphoric acid, it may even be precipitated by neutralizing with lime-water: it is then contained in the precipitate of phosphate of lime, though not in a state of combination.

Upon these facts M. Brucke has based a new method of preparing this important substance, by which it may be obtained in a remarkable state of purity.

The mucous membranes of the stomachs of pigs are digested at a temperature of 38° C., in weak phosphoric acid; when portions of the membranes are seen detached, the solution is filtered off, and the residue digested again at the same temperature in a fresh portion of the acid, until the membranes are completely disintegrated. The filtered liquid should be limpid, and ferrocyanide of potassium should not precipitate albumen from it. Lime-water is added till it is nearly neutralized, or till it gives but a faint acid reaction, with litmus paper; the phosphate of lime is then collected, pressed, and dissolved in water acidulated with hydrochloric acid. It is then precipitated again by lime-water, again taken up by very dilute hydrochloric acid, and filtered. Into the large flask in which this solution is contained a long-necked funnel is introduced, and by it is added gradually, and in small portions, a cold solution of cholesterine in a mixture of 4 parts alcohol, at 94 p. c. and 1 part ether. In contact with the acid liquid, the cholesterine separates in fine particles and rises to the surface; when this coagulum has acquired a thickness of about 2 centimètres, the funnel is withdrawn, and the mixture vigorously shaken, to fix as much pepsine as possible on the chole-

sterine; it is then filtered off and washed with water containing hydrochloric acid, then with pure water, until the washings cease to precipitate nitrate of silver. It is then treated with ether; the cholesterine dissolves, and the adherent water retains the pepsine, and forms a lower layer, which is washed with ether by decantation; it is then filtered if necessary, and a pure solution of pepsine is the result. This liquid, when acidulated, possesses energetic digestive properties; a filament of fibrine disappears at once in it, and one drop added to 5 cubic centimètres of a solution containing 1 gramme of HCl in a litre of water, dissolves a filament of fibrine in the space of an hour. This liquid does not furnish the reactions hitherto considered characteristic of pepsine. It is not affected by any of the reagents which denote the presence of albumen, as concentrated nitric acid, tincture of iodine, tannin, and bichloride of mercury. The latter point is one of great importance, as the pepsine analysed by M. Schmidt was prepared by precipitation with bichloride of mercury. Nitrate of silver renders the liquid slightly opalescent. Bichloride of platinum gives a slight precipitate. It is abundantly precipitated by the acetates of lead, which throw it down even in presence of free acetic acid. The author therefore considers that pepsine has not hitherto been obtained in a state of purity, its analysis has still to be made, and its composition ascertained.—*Annal. der Chem. und Pharm.*

ACTION OF CHLORIDE OF ZINC ON SILK.

BY M. J. PERSOZ FILS.

Solution of chloride of zinc of 60° will dissolve, after some time in the cold, but in a few moments when heated, silk in sufficient quantity to render the solution quite viscous, and to form a thick syrup. This solution diluted with acidulated water may be dialysed; the metallic salt passes through the dialyser, and the silk remains in a mass, having the appearance of starch, retaining however a little zinc; desiccation yields it as an insoluble vitreous residue. The solution might therefore be employed in place of albumen for fixing colours on fabrics, and might also be useful as a varnish. One of its peculiarities is worthy of remark—it is not decomposed below a red heat. Under the influence of heat it yields a red colouring-matter something like murexide, which has not yet been thoroughly investigated. The chloride of zinc solution, rendered basic by oxide of zinc, does not dissolve wool or vegetable fibres, and may therefore serve as a reagent for the separation of mixed tissues.—*Répertoire de Chimie Appliquée.*

ON VERMILION OF ANTIMONY.

BY M. MERMANN.

This substance is a red sulphide of antimony, obtained by precipitating solution of terchloride of antimony by hyposulphite of soda.

The composition and colour of the precipitate varies considerably as the solutions are more or less concentrated, or are employed hot or cold. The author has analysed three different samples.

The first was black; it was precipitated in the cold from an acid solution of terchloride employed in excess.

The second had the colour of vermilion, and was obtained also in the cold with the same solution of antimony, but the hyposulphite was kept in excess.

The third, a dark red precipitate, was obtained by adding the solution of antimony to a boiling solution of the hyposulphite.

All these precipitates contained oxychloride of antimony, which was dissolved out by cold hydrochloric acid. The sulphur was removed by oil of turpentine. Thus purified, the three precipitates, notwithstanding the difference in their colour, had the same composition, and may all be expressed by the formula SbS_3.—*Bulletin de la Société Chimique de Paris.*

TRANSFORMATION OF SUGAR INTO MANNITE.

BY M. E. LINNEMANN.

It is well known that fumaric, malic, and maleic acids are transformed into succinic acid by fermentation with caseine. In this fermentation, which is a reduction, malic acid loses oxygen, while fumaric and maleic acids absorb hydrogen, and M. Kekulé has shown that this addition of hydrogen may be effected directly.

On the other hand, mannite is produced in the lactic and viscous fermentation of sugar, and when the same difference is remarked between this body and sugar, as exists between fumaric and maleic acids and succinic acid, we might expect to realize the transformation of sugar into mannite by direct addition of hydrogen.

$$\underset{\text{Fumaric acid.}}{C_8H_4O_8} + H_2 = \underset{\text{Succinic acid.}}{C_8H_6O_8} \qquad \underset{\text{Sugar.}}{C_{12}H_{12}O_{12}} + H_2 = \underset{\text{Mannite.}}{C_{12}H_{14}O_{12}}$$

The experiment has proved successful. Cane-sugar is converted into grape-sugar by dilute sulphuric acid, and after removing the sulphuric acid the solution is concentrated, and a small quantity of potash added, and then fragments of sodium amalgam are gradually dropped in. The hydrogen is entirely absorbed, and the liquid becomes so hot that it is necessary to cool it.

The reaction completed, the solution is neutralized by sulphuric acid, evaporated and taken up by alcohol. The alcoholic solution deposits mannite in crystals on evaporation.

These have the composition and melting point (165° to 166° C.) of ordinary mannite.

A strong solution of grape sugar absorbs bromine in quantity. But little hydrobromic acid is formed, and it is probable that the bromine here unites directly with the sugar to form dibrominated mannite.—*Annalen der Chimie und Pharmacie.*

ON THE FORMATION OF THE FATTY MATTER AND MANNITE IN THE OLIVE.

BY M. L. DE LUCA.

From the author's researches it appears that the kernel is the first part developed in the olive. When it reaches its maximum development, the weight of the pulp equals that of the kernel. Then the pulp alone augments in weight. The green matter of the leaves and fruit of the olive is always accompanied by mannite. Nearly all parts of the tree contain it. In the leaves it exists at first in small quantity, which increases until the tree flowers; then it decreases, and disappears entirely when the leaves turn yellow. It is also found in abundance in the flowers. Those, however which fall off after impregnation contain none. The fruit just formed contains a large quantity, and retains it while green; but as soon as it becomes ripe, all traces of mannite disappear. Chlorophyll always accompanies it, and disappears with it.—*Comptes-Rendus.**

NOTE ON THE ALTERATION PRODUCED IN LINEN BY SYRUPS.

BY M. P. DORÉ.

Syrups generally, when dropped on linen, and exposed where it becomes dry, deprive the linen of all its tenacity and flexibility, so that it is easily torn. The linen presents the appearance of having been corroded by an acid. In this case the flexibility and tenacity of the filaments disappear, and partake of the molecular property of the sugar; analogous phenomena are observed when linen is moistened with water and exposed to cold, it then also becomes brittle.

The author states that the fact was brought under his notice in the case of an invalid lady, whose anxious husband brought him a bottle of syrup of tolu to examine, and to ascertain what corrosive substance it contained. He publishes it to call attention to a phenomena, which happening in a sick room, and not understood, might damage the reputation of a physician or a pharmacien.—*Comptes-Rendus.*

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* See also 'Pharmaceutical Journal,' vol. iii. 2nd ser. p. 339.

APPOINTMENT OF MR. SQUIRE AS CHEMIST ON THE HOUSEHOLD OF THE PRINCE OF WALES.

Our readers will be gratified to learn that Mr. Squire, the President of the Pharmaceutical Society of Great Britain, and who has held during the present reign the appointment of Chemist on Her Majesty's Establishment, has recently received a similar appointment on the Household of His Royal Highness the Prince of Wales.

MISCELLANEA.

Death from Opium.—An inquest has been held by Mr. Humphrys, in Whitechapel, on the body of Henry Davis, aged 66, who died from the effects of eating opium. He had been in the habit of buying opium, which he took in the form of pills. He was found dead in his room. Dr. Sawyer stated that the opium, by stopping the action of the heart, had been the cause of death. The following verdict was returned—"That deceased died from the mortal effects of opium taken medicinally in excessive quantities."

Alleged Death from Camphor.—An inquest was held on Monday, January 26th, before Mr. Carter, coroner for East Surrey, on the body of Harriet Anna Castledine, aged two years. It appeared from the evidence that the child asked for something to drink, and the father, without looking at the label on the bottle, gave the child a teaspoonful, as he thought, of a mixture, but which proved to be "camphorated oil." The child was afterwards sick, and was convulsed. Dr. Griffiths was called in. The child rallied at first, but convulsions again set in, and she died about thirteen hours after taking the oil. Dr. Griffiths was of opinion that a teaspoonful of camphorated oil was too much to give to a child of that age; but he could not say that it was the cause of death, although the symptoms were precisely the same as would be produced by camphor. The jury returned a verdict "that the child died from the administration of camphorated oil, given by misadventure, and not from any design."

Accidental Poisoning by Oxalic Acid.—A man named Tramwell, residing at Staleybridge, has been poisoned by oxalic acid, given in mistake for Epsom salts by his wife. The deceased was troubled with rheumatism, and his wife procured some Epsom salts and linseed, which she placed near a paper containing oxalic acid, which she had previously purchased for the purpose of taking out stains from linen; and it appeared from the evidence that the wife of the deceased administered oxalic acid in mistake for the Epsom salts. A surgeon was sent for, but the deceased died in a short time. An inquest was held, when a verdict in accordance with the above facts was returned.

Poisoning by Syrup of Poppies.—An inquest has been held at Newport, Isle of Wight, before Mr. F. Blake, coroner, on the bodies of two children, twins, who, it was alleged, had died from the effects of a dose of syrup of poppies. It appeared from the evidence that the children were very weak and sickly, and the mother had sent to Mr. R. Smith, druggist, for a pennyworth of syrup of poppies, as the children were restless. Half a teaspoonful appears to have been given to each of the little patients, who, instead of improving, became much worse, and as the mother was alarmed, Dr. Savage was called in; but in spite of the remedies used, both the children died, and as Dr. Savage was of opinion that death in both cases resulted from the effects of the syrup of poppies, a verdict accordingly was returned.

German Dover's Powder.—Dr. Smyly ('Dublin Medical Press,' November 5) alludes to this preparation as having some advantages over that of our own Pharmacopœia, in the substitution of sugar of milk for sulphate of potash, by which the taste is improved; and the opium and sugar being of nearly the same density, separation does not occur when kept in large quantities.

Tartar Emetic supplied by mistake for Cream of Tartar.—Several persons, who had gone to the shop of Mr. Fisher, druggist, of Goodramgate, York, to purchase cream of tartar, were taken seriously ill, when it was found that tartar emetic had been supplied to them by mistake. It appears that the error arose with a wholesale house from which Mr. Fisher had received his drugs.

Poisonings by Arsenic.—William Sturt was brought before the borough bench at the Town-hall, Brighton, on Monday, March 2, on the charge of "wilfully administering poison to Mary Ann Day, by which she came by her death." The viscera of the deceased had been sent to Professor Taylor for analysis, and the following are the conclusions to which he had arrived:—"I am of opinion that the deceased died from the effects of arsenic, and that this poison had been taken in the solid form, *i. e.* in powder, unmixed with indigo or soot. I think the arsenic could not have been taken in solution; I am sure some of it could not, because, if it had been so taken, it would not again have assumed the solid form in which I found it. From the small quantity found in the liver, I think it must have been taken within twenty-four hours of death." Professor Taylor also stated that he had examined some mincemeat, in which he found no trace of arsenic. He was unable to say how much arsenic had been taken, because of the vomiting and purging, but he found enough to kill another person besides. At the inquest, held on the same day, the jury returned a verdict of "wilful murder against William Sturt."

The trial of John Garner and Hannah his wife, for the wilful murder of Hannah Garner, the first wife of the male prisoner, and Jemima Garner his mother, was concluded on Wednesday, March 18th, at Lincoln. The facts of the case, together with the results of the analysis, were published in our February number, page 377. The jury found both the prisoners guilty of manslaughter, and they were sentenced to penal servitude for life.

Another case of poisoning by arsenic was tried at the Northern Circuit, when a man named Fox, and a woman named Walker were indicted for the murder of George Walker, the husband of the woman, by the administration of arsenic; and although arsenic was found in all the internal organs except the brain, by Drs. Scattergood and Bailden, yet there was no evidence to connect the male prisoner with the administration. It was proved that deceased had himself bought the arsenic for the purpose of killing rats, and had kept it in an open drawer,—and the defence urged was that the poison had been given by accident. This plea having satisfied the jury, they acquitted the woman.

Deaths from the Fumes of Nitric Acid.—A painful occurrence has taken place in Edinburgh, resulting in the death of Mr. Stewart, one of the masters of the Edinburgh Institution, and also of the janitor of the same establishment. Mr. Stewart was in the laboratory of the school preparing for some chemical experiments, and while carrying a jar of nitric acid across the room, it fell on the floor and was broken. He called the janitor to his assistance to wipe the floor and to endeavour to save a portion of the fluid. In this effort both inhaled the fumes of the acid. Mr. Stewart went home to dinner, unconscious of the injury he had received. After an hour or two he began to experience difficulty in breathing, and sent for medical advice; but he very rapidly became worse, and expired at two o'clock on Wednesday morning, March 4th, about ten hours after the accident. The janitor was also taken ill, and, though he rallied for a time on Wednesday, he afterwards sank, and expired at five o'clock on Thursday morning. Several eminent medical men in the city were called in, but their skill proved unavailing.

The Sale of Object-glasses for Microscopes.—Griffiths *v.* Stevens.—At the Clerkenwell County Court, Monday, March 9th, the plaintiff, a pharmaceutical chemist, sued the defendant, an auctioneer in King Street, Covent Garden, for the sum of 17*s.*, under the following circumstances:—The plaintiff had attended a sale in King Street, in December last, and bought lot 418, described as "a two-inch achromatic, by Smith and Beck." It was afterwards found that the glass was not one of Smith and Beck's, but only a single lens, and comparatively worthless, which had been placed in a box on which was engraved the name and address of Smith and Beck. It was urged for the defence that one of the conditions of sale, printed on the catalogue, was to the effect that "the lots were to be taken away with all faults and errors of every description." His Honour, however, said that although the condition referred to might have protected the defendant in accidental *bonâ fide* error, it was of no force in case of fraud, and in this instance the article was described in the catalogue as "an achromatic by Smith and Beck." Judgment was accordingly given for the plaintiff.

BOOKS RECEIVED.

A Manual of Elementary Chemistry, Theoretical and Practical. By George Fownes, F.R.S., etc., ninth edition, revised and corrected. London: John Churchill and Sons, New Burlington Street. 1863.

Cattle Food Adulterations, being a Guide to the Farmer in the Purchase of Oil-cake, etc., with coloured Illustrations. By W. H. Harris, F.C.S., etc. Northampton: Mark Dorman. London: Longman, Green, Longman, and Roberts; and Hamilton, Adams, and Co. 1863.

First Outlines of a Dictionary of the Solubilities of Chemical Substances. By Frank H. Storer. One volume, in three parts. Part I. Cambridge: U. S. A. Sever and Francis. 1863. The object sought in compiling this work is thus stated by the author:—"I was impressed with the great practical importance of a wider dissemination of our knowledge of the solubilities of salts, while, at the same time, I was convinced that Chemical Science itself might gain many advantages if all known facts respecting solubilities were gathered from the widely scattered original sources into one special comprehensive work, and thus presented in an easily accessible form." It was the intention of the author to have collected all the materials and embodied them in a dictionary which might have served as a body of facts into which new and scattered observations could have been incorporated, and from which erroneous statements now current could be eliminated. In proceeding to carry out this scheme, it was found, owing to the great bulk and rapidly increasing complexity of the materials, advisable to alter the plan and publish the first outlines only.

TO CORRESPONDENTS.

Correspondents are particularly requested to observe the following regulation as to the Registration of Letters:—"All inland letters which unquestionably contain coin, even though they be posted without registration, are treated as registered, and charged on delivery with a *double registration of eightpence*, in addition to the ordinary postage." The Secretary informs us that he is frequently called upon to pay this double registration, from the foregoing regulation not being complied with.

Wanted copies of the May, June, July, and August numbers of the Journal, 1852, for which the publishing price will be paid by Mr. Bremridge, 17, Bloomsbury Square, W.C.

G. R.—Candidates for the Classical Examination are expected to be able to translate literally, and to know the grammatical construction of the passages submitted to them.

1. 9. 7 (Maldon, Essex).—Graminaceæ. It is reputed to be alterative and diuretic, and has been used with success in some diseases of the bladder, etc.

Inquirer (Bristol).—See papers by Professor Bentley on *Actæa racemosa*, Pharmaceutical Journal, vol. ii. 2nd ser. p. 460; and on *Podophyllum peltatum*, vol. iii. p. 457. Also, a paper by Mr. Haselden on Tincture of Actæa, vol. ii. p. 544.

Schmidt's Fir-Wool Oil.—We have received a note from Messrs. Watts and Reichardt, of Manchester, referring to an article on "Fir-Wool Oil and Wadding," by Mr. S. Beaver, which appeared in our last number. In this communication it is stated that there are, at the present time, at least two manufactories of these articles, one, that of M. Lairitz, noticed by Mr. Beaver; and the other, that of M. Schmidt, which is more especially referred to by Messrs. Watts and Reichardt. As the subject of Fir-Wool Oil is not a new one, and as references to both MM. Lairitz's and Schmidt's manufactories have already appeared in our Journal (see vol. iii. 2nd ser. p. 29, and vol. iv. p. 376), we think it undesirable to refer further to it at present.

Inquirer (Glossop).—Black Drop. A formula for making "Black Drop," said to be the original recipe by Dr. Armstrong, will be found in the 2nd vol. of this Journal, p. 423. The article formerly sold as "Genuine Black Drop," is no longer to be obtained.

The communications of T. B. Groves and Edwin Yewdall will appear next month.

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. XI.—MAY 1st, 1863.

WORK TO BE DONE, AND HOW TO DO IT.

Our correspondent Mr. Reynolds, in another part of this Journal, suggests a more extended application of the inquiry "Do they manage things better abroad?" than was given to it in the brief remarks we inserted last month. We had then a special object in view, and confined our notice to a single point of comparison; but there is no difficulty, when we look abroad, in finding objects for imitation as well as avoidance.

The employment of committees for investigating or reporting upon subjects of practical or scientific interest to pharmaceutists, is carried out in France, as well as America, to a far greater extent than it has hitherto been in this country. Mr. Reynolds alludes to the American Pharmaceutical Association, which has given evidence of much activity, and might with advantage be imitated by us.

In France, for some time past, pharmaceutical committees have been engaged in suggesting and revising the processes to be introduced into the new French Pharmacopœia, and the manner in which this work is done forms a remarkable contrast with the way in which the British Pharmacopœia has been prepared.

The most able and experienced pharmaceutists of France are enlisted in the work of investigation, and the results of these investigations are published and fully discussed by those who are interested in them, before the final selection of the processes to be adopted is made. It is much to be regretted that a similar course was not pursued here, instead of observing a mysterious secrecy, which seems to imply that extended investigation and discussion are incompatible with judicious selection. It would surely be much better to have all the processes for a new Pharmacopœia publicly discussed and tested before their adoption, rather than afterwards, when there is no opportunity for correcting imperfections. If such a course as this were adopted, there would be ample occupation for committees in different parts of the country, and much valuable information might be thus collected. It has been suggested by the members of some of our provincial associations that the processes in the new British Pharmacopœia, when it appears, will afford matter for discussion at the meetings of those associations. This will no doubt be the case; but with how much better effect would the investigation and discussion of such subjects be carried out, if the results were likely to prove useful by contributing to the general improvement of the work.

Hitherto the few attempts we have made to advance pharmaceutical knowledge, by associations having special and limited objects, have not proved very

encouraging; but this has probably arisen in part from the want of some well-defined practical objects of sufficient importance and interest to ensure the co-operation of the requisite number of able contributors; and we ought not, on this account, to be deterred from making further efforts in the same direction, if there should appear to be a promising field for associated labour. We would suggest that such a field lies at the present time comparatively unopened, yet offering the prospect of ample reward to those who shall turn up the soil. It is represented to contain many valuable mines, but the real nature of the ores that lie buried there is but imperfectly known, and it is more than probable that much of what purports to be precious metal is but mere tinsel and dross. To determine the real value of these hidden or imperfectly-developed treasures, to bring them to light and display them in their true colours, is the work we would assign to earnest investigators, who, being adepts in the art of pharmacy, the science of chemistry, and the profession of medicine, would be able to bring their united powers and experiences to bear in effecting the proposed object.

In addition to the medicines ordered in our national Pharmacopœias, or to be comprised in the British Pharmacopœia,—which we hope will soon be published,—there is a large and increasing number of preparations frequently ordered by medical men, but for which there are no authorized formulæ. New compounds of this description are every day brought out, so that it would not be difficult to supplement the Pharmacopœia with a list more numerous than that of the medicines authorized by the College. This list would comprise the medicines to which we referred last month, and which constitute a class, the number of which it is not desirable to increase. There are, no doubt, many excellent remedies among them; but their compositions, or the processes by which they are produced, are generally known only to those who have introduced them. Preparations of this kind are sometimes ordered in prescriptions without anything to indicate how they should be made, or where they may be procured. We heard the other day of a druggist who came up to London, from a town many miles off, for the sole purpose of obtaining the necessary information and materials to enable him to dispense a prescription which had been sent him by a good customer, and in which medicines were ordered, none of which he had in his shop, or had ever seen or heard of. Yet this was a well-informed pharmaceutical chemist. The information he sought for was but imperfectly supplied at the seat of Pharmaceutical learning in Bloomsbury Square, and the unfortunate country druggist had to search from one end of London to the other for the ingredients to make up, it may be, a two-shilling mixture. A few experiences of this sort would surely be sufficient to bring volunteers to an association, or rather to associations throughout the country, the object of which should be to investigate and determine the composition and mode of production of all preparations ordered in medicine for which there are no authorized formulæ, and to discourage the use of such as remain unknown or uncertain in composition, or to which incorrect names are applied, calculated to deceive those who use them.

We commend this proposition to the notice of Mr. Reynolds and the committees, which we sincerely hope he may succeed in getting formed.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 1*st April*, 1863,

Present—Messrs. Bird, Bottle, Deane, George Edwards, J. B. Edwards, Hanbury, Haselden, Hills, Morson, Sandford, Savage, Squire, and Waugh,—the following were elected

MEMBERS.

CARMARTHEN .....Jones, Charles William.
CHERTSEY.....Boyce, George.
ILFRACOMBE.....Moon, William Henry.
NOTTING HILL.....Fowler, Stanley.
UPPER NORWOOD .....Bireh, Henry Cooper.
STOKE NEWINGTON .....Bolton, Horatio Nelson.

Resolved—"That a Conversazione be held on Tuesday the 19th proximo, at half-past eight o'clock in the evening, and that the Annual General Meeting of the Members be held on the following day, at eleven o'clock in the forenoon, for twelve precisely, for the usual annual business."

BENEVOLENT FUND.

The sum of £25 was given to a distressed Member, Mr. Waugh handed £25 to the Chairman as a donation, and the following subscriptions, amounting to £15. 3*s.*, were announced as having been received during the month of March.

SUBSCRIPTIONS.

	£	*s.*	*d.*
Arnold, Edward, Norwich	0	5	0
Barnard, John, 338, Oxford Street	0	10	6
Fox, William, 48, Church Street, Bethnal Green.....	0	10	6
Faulconer, Robert H., Keen's Row, Walworth	1	1	0
Gale, Samuel, 338, Oxford Street	0	10	6
Gedge, W. S., St. John Street	0	5	0
Gwatkin, John T., Brighton ...	0	10	6
Haselden and Fisher, 18, Conduit Street	1	1	0
Hills, Thomas H., 338, Oxford Street	1	1	0
Howell, Maurice, Peckham.....	0	5	0
Kernot, George Charles, Poplar	0	10	0
Middleton, Francis, 338, Oxford Street	0	10	6
Noakes, Richard, Brighton.....	0	10	6
Pocklington, James, Sydenham	0	10	6
Procter, William, Newcastle-on-Tyne	1	1	0
Rankin, William, Kilmarnock	1	1	0
Rastrick, Joseph L., Southsea...	0	5	0
Redfern, John, Ashby-de-la-Zouch	1	1	0
Rogerson, Michael, Bradford ...	2	2	0
Smith, William F., 12, Keen's Row, Walworth	0	10	6
Squire, Peter, 277, Oxford Street	1	1	0

MAJOR EXAMINATION, *April* 15*th*, 1863.

Bond, Purnell .....Bristol.
Curtis, William .....Bradford-on-Avon.
Wadsworth, Richard .....Preston.

MINOR EXAMINATION.

Borchert, Theodor.....Berlin.
Carty, Michael .....London.
Fleeming, William .....Wolverhampton.
Hickman, William .....Maidstone.
Hicks, James Sellick .....East Looe.
Jones, Henry .....Llanfachraith.
Miller, Thomas Henry .....Crediton.
Neve, Francis Charles .....Knightsbridge.
Phillips, Jonathan ....Godalming.
Pritchard, Urban .....London.
Scruby, William Yull .....Romford.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Baker, Oswald	Mr. Summers	London.
Carrington, John Thomas	Messrs. Butterfield & Co.	York.
Close, George	Mr. Maudsley	London.
Davies, David	Mr. Williams	Cardigan.
Firman, Henry Elliston	Mr. Wilkinson	Manchester.
Fox, William Robert	Mr. Fox	London.
Jackson, Charles Frederic	Mr. Collings	Bristol.
May, Thomas	Mr. Tuck	Oxford.
Rees, Howell	Mr. Howell	London.

EXAMINATION IN EDINBURGH, 14*th April*, 1863.

MAJOR.

Grosvenor, Frederic.....Hanley.
Wink, John Adam .....Edinburgh.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Finlay, James L.	Mr. Aitken	Edinburgh.
Moir, Alexander	Messrs. Macfarlan & Co.	Edinburgh.
Redford, Edward A.	Mr. Nicoll	Edinburgh.

PHARMACEUTICAL MEETING.

Wednesday, April 1, 1863.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to their respective donors:—

The Sculptor's Journal.
The Dental Review.
The British Journal of Dental Science.
The Chemical News.
The Chemist and Druggist.
The Photographic Journal.
The Technologist.
The Educational Times.
Répertoire de Chimie. All the above from their respective Editors.
Bulletin de la Société Chimique de Paris.
The Journal of the Chemical Society.

The Journal of the Society of Arts.
Index to the first Ten Volumes of the same. From the respective Societies.
Dictionary of Chemistry. By Henry Watts. Part I.
Anæsthesia, considered especially in reference to operations in Dental Surgery. By Alfred Coleman, M.R.C.S.
Cattle Food Adulterations. By W. H. Harris, F.C.S.
The Pharmacopœias of Thirteen of the London Hospitals arranged in groups for Easy Reference and Comparison. By Peter Squire, F.L.S.
Parole in Morte di Matteo Blytt.
Coniferas Novas Nonnullas.
*Note sur une Monstruosité des Cônes de l'*Abies Brunoniana. All by Professor Filippo Parlatore, of Florence. From the Author.
Plain and Easy Account of British Fungi. By M. C. Cooke.
A Manual of Botanical Terms. By M. C. Cooke. From the Author.
A Collection of Drugs from Manilla. From Mr. Jacob Zobel, through Mr. Thöl.
Edible Birds'-nests from China. From Mr. T. H. Hills.
Specimens of Scammony Root and Oil of Wormseed. From Mr. W. Ransom, Hitchin.

SYMONS'S STANDARD BAROMETER.

A portable standard siphon barometer was exhibited by Mr. W. Symons, F.C.S.

This barometer was exhibited at the late *soirée* of the Royal Society. It is designed to overcome the practical objections to Gay-Lussac's siphon barometer, which would probably be much more used but for two reasons: viz. there is no arrangement for making it completely portable, and there being a vernier and scale to both limbs of the siphon, two readings are required, which must be added together to get the correct result. The barometer shown has a very simple, but effective arrangement for making it portable, and instead of two verniers, there is a continuous inside brass-tube, adjustable by a rack to the level of the mercury, in the lower limb of the siphon-tube. The barometer is then read off by the vernier attached to the top of this internal tube, in the same way as Fortin's, or other usual standard barometers. With a much simpler and lighter, and therefore cheaper construction, it appears to possess all the desiderata of a standard barometer, while it can be accurately adjusted more quickly, and with less trouble, than instruments with an ivory point dipping into the mercurial cistern.

Professor Bentley said that in the absence of any other communications, he would call the attention of those present to some of the donations to the Museum of the Society, which were now on the table for their inspection. The first he would notice was that of

EDIBLE BIRDS'-NESTS.

Professor Bentley remarked that these nests were very highly valued in some parts of the world, more especially in China, where they fetched an extravagant and altogether fanciful price. Although at first sight they but little resembled birds'-nests, they were really those of certain species of swallow, found in the Indian Archipelago and some neighbouring regions. No less than five species of these swallows had been described by naturalists, but the more interesting were the common Esculent Swallow (*Hirundo esculenta*, Linn., *Callocalia esculenta*, Gray) and the Seaweed-eating Swallow (*Hirundo fucifaga*, Thunb., *Callocalia nidifica*, Gray). These nests varied much in value, according to the time of gathering and their freedom from feathers and other impurities. In China, Professor Bentley said that the clearing of these nests, as he had been informed, was a common occupation with certain of

the lower orders of the people. Some of these nests, as might be seen by specimens on the table, were quite black from the presence of adhering feathers, etc., and were known as *black birds'-nests*. In a popularly-written work, recently published, entitled Hartwig's 'Tropical World,' an interesting account of the mode in which these birds'-nests were obtained from the caves by the seaside, had been given.*

These nests were regarded as restorative in their action, and were much used in China in the preparation of soups, and for other dietetic purposes. They had scarcely any flavour in themselves, but when dissolved in boiling water they formed a very thick mucilage, which was employed as a kind of "stock" for soups, etc.

The most interesting questions which arose respecting these nests were as to their nature and mode of formation. Various opinions had been entertained upon these matters. Some naturalists thought that the nests were formed from decaying animal-matters; others, from the juices of trees mixed with certain lichens or algæ; while others, again, asserted that they consisted essentially of a secretion produced by the birds themselves at the period of nidification. The more generally believed idea was, that they were principally composed of gelatinous algæ. Chemical analysis, however, showed that they contained 90 per cent. of animal matter; hence it was quite clear that their supposed vegetable origin was an error. Indeed, Professor Bentley said, it might now be considered as proved, that at the period of nidification the birds secreted a viscid matter, either by the salivary glands or follicles of the crop, out of which the nests were constructed. This secretion was considered to be analogous to that which the swallows of this country and other parts of Europe secreted at the period of nidification, and by which they cemented together the mud, sand, and other material of which their nests were constructed.† In their properties therefore, it was clear that these nests resembled isinglass, and might be used for similar purposes. There was no evidence to show, nor had we any reason to believe, that they were at all superior as dietetic agents to isinglass, and hence, as had already been observed, the extravagant notions entertained of their value by the Chinese were altogether fanciful.

Mr. Daniel Hanbury said that the question had often suggested itself to him, upon observing the materials out of which the martins constructed their nests in Europe, as to how such matters could be cemented together. It was evident, as mentioned by Moquin-Tandon and others, that at the period of nidification they secreted some glutinous matter for the purpose. He suggested that it would be very desirable to examine these nests, with the view of ascertaining the nature and amount of this secretion.

Mr. P. L. Simmonds said that he could add but little to the interesting account of the nature and properties of these birds'-nests which had been given by Professor Bentley. It was evident that the value set upon them by the Chinese was entirely a fanciful one. He had tasted soup and other dishes prepared from them, and found them very insipid; they were simply useful when dissolved in boiling water as a stock or menstruum for other more highly flavoured substances. In a work which he had published some years since, entitled 'Curiosities of Food,' he had described these birds'-nests. There could be no doubt entertained at the present day of their animal origin, although he was sorry to find that at Kew and elsewhere the fiction of their algal source was still kept up. Burning would at once demonstrate their animal nature. Numerous varieties of these nests were found in the Chinese markets, and their values respectively depended upon the extent to which they had been separated from foreign matters.

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* Hartwig's 'Tropical World,' p. 305.

† Moquin-Tandon, 'Elements of Medical Zoology,' by Hulme, p. 185.

OIL OF WORMSEED (*Chenopodium anthelminticum*).

Professor Bentley directed the attention of the meeting to this remedy. It was obtained from the fruits of *Chenopodium anthelminticum*, a plant found wild in the States of North America, more especially in the Southern States. The plant was also much cultivated in Maryland, near Baltimore, from which neighbourhood the best oil was derived. The plant was officinal in the United States Pharmacopœia, and directions were there given for the distillation of the oil. Wormseed was regarded by American physicians as one of their most efficient indigenous anthelmintics, being especially adapted, it was said, "to the expulsion of the round worms in children." The powdered fruits or oil were the common forms of administration. When given in powder, this was made into a kind of electuary with syrup or treacle. The dose of the powder varied from one to two scruples for a child two or three years old, and it should be administered in the morning fasting, and again at bed-time, for three or more days, and then some active purgative should be administered. The dose of the volatile oil for children of the above ages was from five to ten drops, with sugar or other suitable substance. Professor Bentley said that he had only just noticed this remedy at present, but he should give a full account of its characteristics shortly in the 'Pharmaceutical Journal.' He thought it was a remedy well worthy of an extended trial in this country.

The President said that of all the anthelmintics he had known to be used, nothing had been found so successful for tape-worms, as *the ethereal extract* or *oil of male fern*. Koosso, a substance which had been much vaunted, was, he believed, very inferior to it. The President added that the oil of male fern was commonly obtained from the young rhizomes or roots, but he had found that derived from operating on the young fronds quite as active.

Mr. Hills said that as male-fern oil was so valuable a remedy, he thought it should be introduced into the forthcoming Pharmacopœia, but the President had no doubt already directed the attention of the Pharmacopœia Committee to the subject.

Mr. Hills made some remarks on the employment of glycerine as a preservative agent for vegetable infusions, and as a menstruum for some active medicines. He said he had observed that infusion of roses to which glycerine was added in the place of sugar, kept for a great length of time without undergoing any change, and he thought it would probably act similarly in other cases. It had been suggested as a solvent for atropine and some other active remedies of that kind; also associated with starch as a substitute for grease in ointments. He thought the question of what applications can be made of glycerine in medicine was worthy of a further investigation than it had hitherto received.

Mr. Haselden said he had devoted some attention to the subject of glycerine as a pharmaceutical agent, but the results he had obtained, excepting in a few instances, had proved rather unsatisfactory than otherwise.

PHARMACEUTICAL MEETING, EDINBURGH.

There was a scientific meeting held in St. George's Hall, George Street, on Thursday evening, 16th April, at 9 o'clock; Mr. Aitken, President, in the chair.

The Chairman stated that the Committee had now decided on the respective merits of the essays sent, in competition for the President's and Register Fund Prizes. The sealed envelopes being opened, of those having the following mottoes, "In all labour there is profit," and "Palmam qui meruit ferat," it was found that the author of the former was Joseph E. Stevens, with Messrs. Jeffrey and Sons, Cheltenham, and to him the first or President's Prize was awarded; while the latter represented Thomas

Collier, with Mr. W. Collier, Sheffield, and to him the Register Fund Prize was given. The subject chosen by Mr. J. E. Stevens was "Chloroform and Chloric Ether, considered more particularly in their application to Pharmacy," and the Prize was Macaulay's 'Essays,' in two volumes, handsomely bound. The paper of Mr. Thomas Collier was on the "Botany, Chemistry, and Utility of British Lichens and Algæ," and the Prize 'Self-Help,' by Smiles, in one volume. Intimation was given that prizes will be awarded next session for the two best essays on any chemical or pharmaceutical subject, the papers to be sent to the Secretary on or before 1st March, 1864.

The PRESIDENT then delivered his Valedictory Address.

Gentlemen,—In bringing the eleventh session to a close, I beg on this, as has been done on former occasions, to place before you a *résumé* of our proceedings; and in doing so, I take this opportunity to tender my thanks to the gentlemen who so kindly have assisted us, and particularly to those who have read papers at our scientific meetings.

You will recollect that at our first meeting in November last, we had a very able paper, "On the Range of Studies subservient to Pharmacology;" by Dr. William Seller, F.R.C.P., Edinburgh. In the course of this lecture the Doctor pointed out to us that Pharmacy, as a vocation, stands not only in the position of a scientific pursuit, but entitles those who pursue it to rank with the learned professions; and also, that Natural History, and Chemistry in particular, owe much of their advancement to pharmaceutists. After taking notice of some of the medicinal plants at present in use, and that were known to the ancients, the Doctor adverted to the medicines made known by the Arabian physicians and pharmacologists—those medicines introduced by European physicians and pharmacologists in their own several countries, and spread over the rest of Europe, after the revival of letters down to the present time. He then mentioned the medicines introduced into Europe by European travellers or settlers in America and the Eastern World, and those which are now poured upon us, with so lavish a hand, from the medical practice of the Transatlantic physicians and pharmacologists of the United States of North America. The Doctor concluded his very able paper by impressing upon his hearers that the observations he had made were intended to show that pharmacology possesses an inexhaustible field for its operations; that as it belongs to the physiologist, the pathologist, and the practical physician, to study the nicer operations of medicinal agents, it is the duty of the pharmacologist to make himself master of their natural properties, and, in particular, their chemical relations; that without a knowledge of the uses to which each is to be applied, he cannot make his skill available for giving to each its proper form; that knowledge, however much he is entitled to expect it, in ordinary cases, from the physician, nevertheless, in taking new substances into their common domain, the efforts of both must concur. The Doctor in conclusion said, that while we strive with good reason, and for the most desirable ends, to separate pharmaceutical from medical practice, wherever the advancement of knowledge comes to be the object, pharmacology and medicine coalesce at innumerable points, and, in consequence, must proceed hand-in-hand.

Our next scientific meeting was held on the evening of Wednesday, 17th December, when Dr. Stevenson Macadam read a paper on Liquid Diffusion, and its applicability for the analytic separation of substances. This lecture was rendered very interesting by many experimental illustrations. The Doctor commenced by stating that the process of liquid diffusion enabled the chemist to separate substances from each other with great facility, and by very simple means. He passed a very high eulogium on Mr. Graham, the present Master of the Mint, who had worked long and laboriously at this department of scientific inquiry, and whose researches indeed had supplied all the known facts and consequent deductions. That liquid diffusion had been discovered at the same epoch as spectrum analysis, and both were real auxiliaries to the ordinary modes of investigation; for whilst spectrum analysis supplied a means of detecting and recognizing the minutest traces of every ingredient in a complex substance, liquid diffusion gave the power of successfully separating these ingredients from each other. The Doctor then carefully explained the various forms of apparatus which could be employed in liquid diffusion, and by a few neat, simple, and interesting experiments, illustrated these modes of operating. He then alluded to the importance of this branch of science in physiological inquiries, and to the great influence which liquid diffusion

must exert in the absorption of food elements by the animal system. The learned Doctor concluded his very excellent paper by stating that the science of Geology also was likely to be enriched by the explanation given of the separation and crystallization of minerals; and the importance of liquid diffusion in the detection of poisonous substances, and in the extraction of active principles from crude materials by the pharmaceutist, could not be over-estimated.

At our next scientific meeting Dr. Murray Thomson read a paper, being a description of Dale's new method for the manufacture of Oxalic Acid from Sawdust acted upon by Alkali, which he illustrated with specimens and drawings. He showed, by proper manipulation, that two pounds of sawdust were made to yield one pound of oxalic acid, and that during one part of the process most of the alkali was recovered, and used again in succeeding manufacture; that in Mr. Dale's establishment alone were produced about nine tons weekly of this chemical product. At this meeting, Mr. John Mackay described and submitted various specimens of the new French Carboniferous preparations about to be introduced to this country by Professors Pichot and Malapert, of Poictiers, for the purpose of disinfecting and dressing wounds, ulcers, and the like.

At our several meetings for examination we have admitted a number of young men, who, generally speaking, have passed their examinations with much credit to themselves and to the Society.

You will remember that prizes were offered for essays on any subject connected with pharmacy or medicine. I am happy to be able to state that a number have been sent in, and your Committee have adjudged prizes for two of those: the President's Prize for the essay on Chloroform and Chloric Ether, considered more particularly in their application to Pharmacy, and the Register Fund Prize for the essay on the Botany, Chemistry, and Utility of British Lichens and Algæ. To our library we have added a number of new books, the Council have also arranged to take in some periodicals; and these, after the first week, will be given out under certain regulations. We are given to understand that some good specimens for the museum are expected soon to be sent from the Parent Society in London. The New Pharmacopœia we confidently are assured will be published by the end of this year.

And now, Gentlemen, in withdrawing from the chair, I beg to thank you for the patient hearing you have given to the few imperfect remarks that I have offered, and for your often-exhibited indulgent kindness which has been accorded me, and which has very much lightened the labour of my task. To my fellow-members of the Council, and more particularly to our Secretary, Mr. Mackay, I cannot sufficiently express my obligations. In conclusion, Gentlemen, appreciating as I do the high honour of being your President, I can only express the wish that I had been more worthy of the position which, through your kindness, I have occupied. These are not words, Gentlemen, of mere idle form, nor of that kind of deceptive diffidence which is sometimes used upon such an occasion; they are, gentlemen, I assure you, expressions of my own mind, because I think that a Society such as ours should be presided over by one of acknowledged ability and of some eminence, a position to which I will not be so presumptive as to lay claim. The honour has certainly been mine. It is an honour of which any one may be proud, and I assure you I feel it not only as such, but as a pleasure, to have served you. I feel at the same time a satisfaction in knowing that though I am no longer to occupy this chair, I have still the pleasure of a seat at the Council Board, and of enjoying the society and the goodwill of the members of this branch of the Pharmaceutical Society of Great Britain.

At the close of the address, intimation was made regarding the summer hours of attendance in connection with the library; and further, that those whose essays had been unsuccessful, would be returned to the owners, with the sealed envelopes untouched, on application to the Secretary.

The ANNUAL MEETING of the Pharmaceutical Society in Edinburgh was held in the Café Royal, on Tuesday evening, 21st April, at 8 o'clock; Mr. AITKEN, President, in the chair.

The Secretary read the following Report for 1862:—

THE ANNUAL REPORT.

The Council have, as usual, to lay before the Society their Annual Report for 1862–63.

The scientific meetings have been four in number, and certainly not devoid of attraction. They have been already noticed in the President's Address; and it may only be remarked, that while thanks are due to those who have contributed to these meetings, yet the Council cannot but feel that much more might be done to increase the number and the interest of these *réunions*, were those connected with the Society to show greater anxiety, and, either themselves or through their scientific friends, contribute papers during the session.

The Museum is now getting rapidly into shape under the charge of Mr. Hill, and contributions will be gladly received of such specimens as may not already be in possession of the Society. The Council is in hope that, ere long, considerable additions may be expected from Bloomsbury Square, as there are many valuable articles which were obtained at the close of the International Exhibition, some of which are expected to be sent down here.

The Library is every year becoming more attractive, and it is with much pleasure the Council are able to report that during the past session more applications have been made for books than usual, and they trust that the privilege accorded to those in connection with the Society, in obtaining the use of books, may be more extended than ever. With this object in view, arrangements have been made, by which the distribution of volumes throughout the summer months will be continued. It is a source of satisfaction to know, that, in consequence of the judicious proceedings of the Council in London, the expenditure in connection with the publishing of our Journal has been during the past year very considerably decreased. This augurs well for the future, and the present opportunity is again taken advantage of, to urge the desirableness of rendering some portions of the Journal more practical and interesting to the great bulk of its readers, and by lessening abstract, increase the useful, to Pharmaceutists generally. Some improvement has been made in this respect, but it is thought that still further changes of the kind indicated, would result in the extended circulation of the Journal, and give increased satisfaction to those connected with the Association.

All must unite in a feeling of disappointment as to the non-appearance of the new Pharmacopœia. It was expected long ere this, but the Council regret to think that as yet the proof-sheets have not been printed. Hopes are however entertained that by the close of the present year, the work will be published and in general circulation.

The following is the financial statement for 1862 :—

Dr. *The Secretary in account, from 1st January to 31st December*, 1862. *Cr.*

1862.		£	s.	d.
Aug. 11.	Cash from London	50	0	0
	Balance due	14	15	6
		£64	15	6

1862.		£	s.	d.
	Publications for Library	3	17	7
	Expenses of Meetings	7	1	0
	Wemyss (Messenger)	1	10	0
	Expenses of Annual Meeting	3	1	6
	Postages	1	6	2
	Rent of rooms	25	0	0
	Cases for Museum and Library	10	0	0
	Smith and Bellhanger	0	18	6
	Insurance	0	7	6
	Printer's account	4	14	0
	Attendance at meetings, envelopes, etc.	1	19	3
	Mr. Hill, as Curator	5	0	0
		£64	15	6
Dec. 30.	Due Secretary	14	15	6

We, the undersigned, have examined the foregoing accounts, with voucher attached, find them correctly stated and entered, and the balance due to the Secretary, at 31st December, 1862, fourteen pounds, fifteen shillings, and sixpence sterling.

WILLIAM AITKEN.
JAMES GARDNER.
WILLIAM AINSLIE.

Edinburgh, 21*st April*, 1863.

The Council fancy that the new Bye-Laws of the Society are scarcely sufficiently understood, although these have been very fully published in the Journal. It may therefore simply be stated, that the fee to become a Registered Pharmaceutical Chemist, after having successfully passed the examination, is now £10. 10*s.*, and this enables the party so registered to become a member of the Society on application to the Council in London, and paying an annual subscription of £1. 1*s.* In like manner, pupils and assistants may be registered as such, on passing the examination, and paying respectively £2. 2*s.*, and £5. 5*s.* (if not previously a pupil); and these again can be admitted as apprentices and associates of the Society, on application and paying 10*s.* 6*d.* per annum. In all these cases the Journal is supplied without charge. The Council therefore will be glad to find the number of candidates for examination increased.

The Council cannot but advert to the singularly well-fought battle, by which the Council in London obtained for Pharmaceutical Chemists throughout England and Wales, exemption from serving on juries. Much praise and credit are due to the London Council for their persevering and successful efforts in gaining this boon, even in the face of Government opposition. It is however matter of regret that the Bill did not extend its operation to Scotland. There was however no time left to introduce a clause to this effect; for it will be remembered that the Bill itself was obtained just before Parliament closed its labours for the Session. Fully alive however to the importance of this measure, a deputation from the Council here waited upon the Lord Advocate of Scotland, and were very courteously received. His Lordship listened attentively to the statements made, and though making no promise, intimated, he would not fail to remember the peculiar position in which members of the same Society were placed, in reference to this Bill, simply because they resided in Scotland.

Before closing this Report, the Council would call upon all members, both here and throughout the country, to contribute towards the Benevolent Fund of the Society. The claims of this fund have in some unaccountable manner been allowed to fall aside, and not only is its operation a mystery to many, but its very existence appears to be unknown. It may be shortly stated, that this fund is intended, and kept exclusively, for the purpose of assisting members of the Society who may, from unforeseen causes, old age, decayed health, or any other such reason, become unfortunate and in need of assistance. The fund is under the control of the Council in London, and is now in active operation; more than one grant of money having been made in special cases. Every confidence may be felt in the administration of the fund, as the Council take proper steps to ascertain the correctness of any application for relief. Annual subscriptions or donations will be received by the Secretary here and forwarded to London.

The meeting unanimously approved of the Report, and the following Office-bearers were proposed and elected for the next session:—

President.—Mr. G. Blanshard.

Vice-President.—Mr. Kemp (Portobello).

Council.—The President and Vice-President, and Messrs. D. R. Brown, Flockhart, Gardner, Gray, Smith (Kilmarnock), Kirkwood (Stirling), Raimes, Stephenson, Young, Tait, and Ainslie.

Examiners.—The President and Vice-President, and Messrs. Brown, Gardner, Aitken, Stephenson, Ainslie, and Tait,—with the President and Vice-President in London, and Secretary, Edinburgh, *ex officiis.*

Recommended as Member of Council in London.—Mr. Mackay.

Curator of Library and Museum.—Mr. William Hill, Associate.

Library and Museum Committee.—The President, Vice-President, and Secretary, and Messrs. Ainslie, Stephenson, and Young.

Secretary.—Mr. John Mackay.

THE ANNUAL PHARMACEUTICAL SUPPER.

Immediately after the Business Meeting, the Annual Supper of the Society was held, Mr. G. Blanshard, the new President, in the chair, and Mr. Kemp (Portobello) officiating as Croupier.

There were about eighty gentlemen present; amongst whom were—Professor Archer, Dr. Stevenson Macadam, Dr. Murray Thomson, Dr. Alexander, Dr. Carmichael, Dr.

Young, Mr. James Duncan, Dr. James Young, Mr. Nicol, etc. A letter of apology for absence was read from Dr. Sellar.

After an excellent supper, the usual loyal and patriotic toasts were given by the Chairman; that of "The Navy, Army, and Volunteers" being responded to by Mr. Kerr. The Chairman then gave, "The Lord Provost, Magistrates, and Town Council of Edinburgh;" Dr. Alexander replied. The Chairman in proposing the toast of the evening, "The Pharmaceutical Society of Great Britain," said, that from its increasing importance it was fast becoming one of the societies or institutions of the age. All present had been benefited to a greater or less extent from the Society; and he believed it was calculated to confer even greater benefits than it had yet done, if an increased number would interest themselves in it and become well acquainted with its operations. He was peculiarly gratified to observe that every year the number of candidates was greatly increasing at their examinations. He was sure that if the gentlemen present would take an increased interest in the Society, they would be highly gratified and amply rewarded with the results. The remaining toasts were—By the Croupier, "The Royal College of Physicians and Surgeons," which was replied to by Dr. Carmichael; "Pharmaceutical Education," proposed by Professor Archer; "President of Council, London," proposed by Mr. Aitken, and replied to by Mr. Mackay; "The Memory of Jacob Bell," proposed by the Chairman; "Professor Archer," proposed by Mr. Mackay; "The Unity of the Society," proposed by Mr. D. R. Brown; "Dr. Macadam and the other Ordinary Members in Scotland," proposed by the Croupier, and replied to by Dr. Macadam; "The Council and Board of Examiners in Edinburgh;" "The Retiring President;" "The Country Members;" "The Visitors Present;" "The Ladies;" "The Chairman;" "The Croupier;" and "The Secretary."

LEEDS CHEMISTS' ASSOCIATION.

The Fourth Ordinary Meeting was held on Wednesday evening, April 15, 1863, at the Town Hall; the President, T. Harvey, Esq., in the chair.

The following were elected Corresponding Members:—Messrs. H. B. Brady, F.L.S., Newcastle-on-Tyne; H. Denny, A.L.S., Leeds; R. Parkinson, Ph.D., Bradford; J. Coupland and R. H. Davis, Harrogate; James Houlton, Wetherby.

The donation of between thirty and forty volumes to the Library, from members of the Association, was announced.

Mr. R. M. Atkinson read a paper upon "Acetic Acid." He commenced by alluding to the very early period of the world's history at which the acetous principle entered into the food of man. It could not have been otherwise, when we consider how readily the juice of grapes would undergo the vinous and then the acetous fermentation. It is expressly named by Moses, 1500 years B.C. Although vinegar was certainly well known to Eastern nations from this period of antiquity, no definite conception of its formation was held by them. The early fathers of medicine often allude to it, as was shown from Hippocrates and Dioscorides. Geber, the Arabian alchemist, who lived about the middle of the sixth century, was acquainted with the distillation of vinegar, but distilled vinegar was only admitted into the Pharmacopœia in 1724. Pliny says it was made from figs, and that those of Alexandria gave a superior vinegar to those of Cyprus. He alludes to "oxymel," and tells us how to make it, viz. honey, ten pounds; salt, one pound; old vinegar and rain-water, each five pints. Vinegar of squills was used in the cure of seventeen diseases, and esteemed the more the older it became. Quintus Serenus Samonicus, a minor Latin poet, wrote verses in praise of vinegar for curing diseases. Paulus Ægineta, Galen, Avicenna, and Prosper Alpinus treat of it. Friar Bacon, in his 'Radix Mundi,' written at the commencement of the thirteenth century, says that it was used by the alchemists to "cleanse" mercury by cementation. Fermentation was in most instances the source of the vinegar known to these writers; but its distillation from acetates was practised by some of them. Glauber (*circa* 1650) was the first European who produced it by the destructive distillation of wood. This limitation of priority is needful, because Pliny (b. xvi. c. 22) tells us that the Egyptians distilled wood cut into

billets, by applying fire on every side. Berzelius remarks that this operation was a part of the secret of mummification now lost to us. It is singular how slowly the acid produced by destructive distillation took its place as a substitute for that of fermentation. The present century had set in, and several years of it expired, before pyroligneous acid was anything but a waste product in the manufacture of charcoal for making gunpowder. The difficulty of purifying the empyreumatic tarry liquor was the reason of this. The only use then made of the crude acid was to produce acetate of iron for the calico-printers. The author showed that the discovery of oxygen by our illustrious townsman Priestley immediately led Lavoisier to the idea of the true nature of acetification. De Saussure, Vauquelin, and Homberg disputed about this question. The latter tied a bottle of wine to the sail of a windmill, and let it revolve for three days, when it was found to be changed to vinegar. Dr. J. Davy first proved the identity of the acid obtained by fermentation and oxidation of alcohol by spongy platinum. Berthollet had in 1785 denied this identity of the acid given by distilling verdigris, being misled by the acetone. Lowitz mixed vinegar into a paste with powdered charcoal and then distilled in order to concentrate it. The views of modern chemists as to the nature and relations of acetic acid were detailed, and descriptions given of the manufacture of vinegar. Mr. Atkinson devoted the remainder of his paper to the consideration of medicinal acetic acid. He said that it was first recognized in the London Pharmacopœia in 1836. In 1851 it was transferred to the lists of Materia Medica, with the stipulation that it should have the density of 1·048, and that 100 grains should saturate 87 grains of crystallized carbonate of soda: tests of the absence of impurities being added. Mr. Atkinson gave a tabulated report of his analyses of twenty-one samples of acetic acid furnished by wholesale drug houses, and in all cases purchased as being of the strength prescribed by the Pharmacopœia.

Standard: spec. grav. 1·048; real acid, 30·8 per cent. Found—

Real acid.	Real acid.	Real acid.
23·9	25·5	26·5
25·5	26·5	*25·5
26·8	29·9	29·0
†35·4	27·0	27·0
30·5	28·4	31·0
26·0	29·0	25·0
26·3	29·0	**31·0

That great deficiency of strength is the rule, and not the exception, is manifest. The specific gravity was taken in several cases, and in * it was 1·0476. This would carry real acid to the extent of 30·8 per cent., if no substance had been added to raise the density. Such fraud was detected in this case only, sugar being proved to be present, and fictitiously increasing the strength by 5·3 per cent. The sample ** cost 2*s.* 8*d.* per lb.; the others were almost invariably 8*d.* per lb. only. The sample † was sent by a firm who at first delivered the strength immediately above it in the table. It afterwards transpired that at a venture they had emptied half a gallon of *glacial* acid into six gallons of that previously sent, and had no idea that they were giving "too good a pennyworth."

The President called attention to the bearing of this question of the strength of acetic acid upon its medicinal derivatives, such as acetate of ammonia. He pointed out the difficulty of observing the directions of the Pharmacopœia, which orders that this preparation shall be neutral. The attempt to hit this point often resulted in alkalinity, which was objectionable, whether for internal use or topical application. It would be preferable if a trifling excess of acid were allowed.

Mr. Atkinson exhibited a specimen of this preparation, made by neutralizing the acid by Liq. Ammoniæ instead of the carbonate. A neutral solution was thus readily obtained, because the complication resulting from carbonic acid could no longer affect the test-paper.

Mr. F. C. Clayton (Associate) remarked that this substitution of Liq. Ammoniæ would reduce the strength of the preparation, unless a stronger acid were to be kept and used. He had examined the strength of Beaufoy's Commercial Acetic Acid, and found it to contain 26·8 per cent. of real acid. Mr. Sutton, in his new work on 'Volumetric Analysis,' gives the strength at 26·5 per cent.

Mr. Ward said that the strongest objection to the change which had been suggested, would be found in the trace of tarry odour which nearly all Liq. Ammoniæ showed when it was neutralized.

Mr. Yewdall introduced the subject of "Some Ferruginous Salts." He exhibited a fine collection of sealed preparations, lent by Messrs. Howards and Sons, and also called the notice of the meeting to the granular and other newer salts of iron. The great extent of the subject induced him to select one point for investigation in the first place. That was Tinct. Ferri Sesquichlor.; a preparation which the Pharmacopœia stated should yield nearly 30 grains of sesquioxide of iron to the fluid ounce. He had obtained for examination fifteen specimens of this tincture, and gave the following as the result of their analysis. He was ignorant as to who was the vendor of each, and wished to remain so, having arranged with the person who purchased them that the labels should be removed.

Grains per fluid ounce of Fe_2O_3 precipitated

18·0	31·2	28·4
26·8	20·0	36·4
29·2	32·6	32·0
32·4	31·2	22·0
15·8	24·4	36·2*

Mr. Yewdall exhibited the tinctures, and called attention to the palpable fact that three of them, although sold without any such intimation, were made from "cleaned" methylated spirit. The odour of Sp. Æther. Nitr. contained in this class of spirit, was readily detected in the tinctures. All these three specimens were very dark in colour, but why it should be so was not so evident.

The President alluded to the thoroughly practical character of this communication, as also of the preceding one. He said that the use of the sesquioxide of iron of the Pharmacopœia was productive of much annoyance, because a solution of sesquichloride of iron had the property of dissolving hydrated sesquioxide. Gradually, this lost its water of hydration, and the tincture gave a deposit of sesquioxide. The calcination of the sesquioxide before treating it with hydrochloric acid had been thus forced upon many chemists.

Mr. E. Brown confirmed the President's statement as to the unsatisfactory results of the Pharmacopœia process. He had followed it literally, and been much disappointed.

The question of holding an extra meeting in May was left to the decision of the Committee.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Inaugural Meeting of this Society was held at the Town Hall on Tuesday evening, February 24th.

There was a good attendance of Members and Associates.

The rules having been read over and passed, the following donations to the Library were announced:—

	£	s.	d.		£	s.	d.
Mr. Bass	5	0	0	Mr. Parr	1	1	0
Dr. Robertson	1	1	0	Mr. J. H. Atherton	1	1	0
Dr. Popham	1	1	0	E. H. Lineker, Esq.	0	10	6

Bentley's 'Manual of Botany;' Wittstein's 'Pharmaceutical Chemistry.' From W. Wood, Esq.

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* The average given by these figures is 27·8 grains, whilst twelve analyses by Mr. J. M. Davenport (Pharm. Journ. Feb. 1863) gave an average of 28·43 grains.

Smith's 'Introduction to Botany.' From T. A. Stephenson, Esq.

The whole of the new series of the 'Pharmaceutical Journal.' From the Pharmaceutical Society.

Three vols. of the 'Chemist;' four vols. of Thomson's 'Chemistry;' Reid's 'Text-Book for Chemical Students.' From Mr. Dudgeon.

Thomson's 'Vegetable Chemistry;' Lindley's 'Introduction to Botany.' From Mr. Parr.

Seven vols. of the 'Pharmaceutical Journal,' and eighty-four loose numbers. From J. H. Atherton.

Mohr and Redwood's 'Practical Pharmacy;' Rennie's 'Supplement.' From Mr. Jenkins.

Brande and Taylor's Chemistry. From E. H. Lineker, Esq.

The thanks of the meeting were unanimously accorded to the donors for their liberal gifts.

The PRESIDENT, Mr. Parr, then delivered the following Inaugural Address :—

Previous to making the remarks which I have to offer before this our first meeting of the Nottingham Chemists' Association, I think it would be interesting to those members who did not attend our preliminary meetings, and also afford information to the honorary members now present, were I to give a brief outline of the objects of the Society, and the means by which those objects are intended to be carried out. First,—There will be short elementary courses of lectures on Chemistry and Pharmacy for the associates; and who knows, as Dr. Robertson remarked the other evening, that a second Sir Humphry Davy may not emanate from the instruction imparted by those lectures, who, by making some grand discovery, will become an honour to the land in which we live, and a credit, not only to himself, but also to the Society which first gave him a taste for chemical inquiry? Secondly,—Papers will be read upon Chemical and Pharmaceutical subjects, and discussions thereon encouraged, which, no doubt, will be the means of promoting scientific knowledge amongst our members. Thirdly,—All new remedies, as from time to time they are introduced before the public, will be noticed by the Society, their merits discussed and their properties explained, both as regards the diseases for which they are employed, and the doses to be administered. Another feature of the Society is the formation of a library of standard works on chemistry, pharmacy, materia medica, and botany, for reference and circulation amongst our members. Now, I think you will at once admit that individual effort cannot accomplish all this. It requires associations like this now formed, where interchange of thought and free discussion will encourage the bringing out of that knowledge which each and all of us may possess, and by a steady perseverance I trust we shall not only gain the confidence of our professional friends, but also that of the public at large. In fact, I am quite of opinion that institutions like this are calculated to raise us, as a body, in the scale of society, and make us wiser and better men. Now, Gentlemen, you will agree with me when I say that this is a vastly progressive age in which we live, and to keep pace with the spirit of the times will require constant application and no ordinary amount of study. We must not be like the alchemist of old, who spent year after year over his crucible, stirring up the various metals he had hap-hazard introduced into it, imagining that some day or other they would be turned into gold, or that he would be fortunate enough to find the philosopher's stone. But taking science for our barque, and reason to guide the helm, we must energetically pursue an inductive course of study and systematic training; and when observation upon observation has been recorded, and fact after fact elicited, we may hope to arrive at the truth, and eventually have our most sanguine expectations realized. It will be necessary for me only to glance at some of the discoveries of the last century in conjunction with a few that have been brought to light in our own day, to prove the truth of these assertions; and passing over the elastic properties of steam and its relation to the production of locomotion—the facilities it has given to our manufacturers—together with many improvements in the operations of the laboratory, I will ask your attention for a short time to a few of the wonderful discoveries which the science of chemistry has brought to light within the recollection of most of us now present. Let us take for instance some of the preparations which are made from coal; and first of all we have our now

universally adopted artificial light—the gas which illuminates our streets, our houses, and our factories, in contradistinction to the oil-lamp of olden times, or the ordinary candle. Without gas, half our time would not be available, in a manufacturing point of view. The humble poet in his garret *might* possibly manage to indulge in the flights of his imagination by the sombre light of his "midnight oil," but I fancy the industrious artisan would experience a difficulty in working his delicate fabrics, such as Nottingham produces, were it not for this invaluable invention. Next, we get benzol and aniline,—the former so indispensable to our household economy when the comfort and happiness of the ladies are objects of considerations; for without benzol I verily believe some of the fairer sex would die of vexation, when a favourite dress had met with the misfortune of becoming soiled; and from *aniline* are obtained the mauve and magenta dyes, rivalling both in beauty and intensity of hue the exquisite tints of the choicest productions of the conservatory, the flower-garden, and the forest,—the magnificent camellia, the modest violet, the crimson anemone, or the more delicate peach-blossom. Then, again, we have carbolic acid, which is the most powerful disinfectant I am acquainted with. In combination with sulphite of magnesia and lime, it effectually removes the noxious effluvia arising from animal and vegetable decomposition, forming substances perfectly inodorous. The *modus operandi* I need not stop to explain; suffice it to say that the sulphurous acid converts sulphuretted hydrogen into sulphur and water, both inodorous, while the carbolic acid coagulates the albuminous matter, and prevents its further decomposition. A similar action takes place when phosphuretted hydrogen is present. I will only notice in passing the large quantity of ammonia obtained from the refuse gas-liquor now so extensively used in fertilizing our pastures and cornfields, as also in the manufacture of several articles of commerce,—alum, volatile salts, sal ammoniac, etc. Of course this subject is far from being exhausted, and I would suggest that its consideration may form an excellent Paper to be read before the Society at some future period. But I will now pass on to another grand discovery of our own day, and who, may I ask, would have believed some twenty or thirty years ago, even amongst the members of our learned professions, that by a scientific combination of carbon, hydrogen, and chlorine, a person might have a limb amputated without experiencing the slightest degree of pain? Yet so it is. Chloroform has been introduced, almost like a dispensation of Providence, to alleviate the human sufferings incidental to surgical operations. It is useless, however, to multiply examples of the benefits resulting from chemical discovery. I will instance only two others as illustrative of the forward movement of the present age,—the science or art of photography, and the electric telegraph. These exhibit in a pre-eminent degree the increasing desire, the extreme eagerness which most people nowadays evince for the immediate possession of the objects of their pursuits. Who could have imagined, not many years ago, that the same subtle fluid which illuminates our atmosphere with gorgeous colours, and generates the grand artillery of heaven, pealing forth its thunders from amongst the agitated clouds, should be made, by means of scientific investigation, subservient to the transmission of our thoughts? Yet, such is the fact, and I certainly consider the electric telegraph the most wonderful discovery of recent times. But, as men of business, we have not so much to do with these higher branches of science as with the practice of pharmacy, or the preparation of medicines, which I may term the every-day requirement of our calling. When a physician or surgeon prescribes a special remedy, he expects it to be supplied in its integrity. Its substitution, in any way, not only disappoints him of the effect intended to be produced, but also, to an equal extent, jeopardizes his reputation, irrespective of the injury inflicted upon the patient by the inactivity of the remedy substituted. In organizing this Society, let us therefore begin *de novo*, as it were, and make ourselves thoroughly conversant with everything connected with our vocation and the articles we have now to deal with are becoming very numerous, both as regards the purity of our chemicals, the admixture of our drugs, or the adulteration of our powders; so that if perchance any of them is ever supplied to us not genuine, we may at once be able to detect the imposition, and expunge it from our establishment. I recollect some years ago a traveller from a new chemical house in London inducing me to purchase a quantity of iodide of potassium, which he represented as being of very superior quality. The sample to all appearance was good; but when the bulk came in I found it to contain 75 per cent. of adulteration with carbonate of

potash. The parcel was returned, with the request that the iodide and carbonate might be put into two separate bottles, and not mixed together; which latter was evidently a mistake! This shows how careful we ought to be in the selection both of our drugs and chemicals, and more particularly from houses of unknown respectability. We should not, however, attempt too much at first, but commencing from the very lowest step of the ladder, let it be our aim to rise gradually; and when our medical friends see that we are determined to do justice to the important position in which we are placed, I feel confident we shall receive their co-operation and support. To you, Gentlemen (honorary members), we shall have to look for counsel and assistance until our Society gets thoroughly established; and I trust it will be a mutual pleasure, as well as a mutual benefit, for all of us to meet together for the purpose of discussing matters of science connected with our respective avocations. I suppose you are all aware that we are on the eve of having a new Pharmacopœia, under the sanction, and recognized by the united faculty of the three colleges of London, Edinburgh, and Dublin. Therefore we may now expect greater uniformity in our preparations than could possibly exist when each of these colleges laid down different rules for our guidance. An Edinburgh physician's prescription would be made up in Nottingham, or at any other place in England, with medicine prepared according to the formulas of the London Pharmacopœia, and *vice versâ*, which, in some cases, might not meet the wishes of either party (the forms of the two colleges being different in many instances); and, therefore, the uniformity effected by the new Pharmacopœia will, I consider, be most beneficial. Many of our forms, no doubt, will undergo alteration, and new preparations will probably be introduced. It will, consequently, be our duty to make ourselves thoroughly acquainted with the new Pharmacopœia as early as possible, and its consideration will afford, during our first session, ample scope for discussion and improvement. Lastly, I would urge upon you all to exert yourselves to the very uttermost for the advancement of our Society; and, by each one contributing his mite towards the object we have in view, we shall individually become tributaries to that stream of events which, I hope, some day or other, may encircle us with respect, with honour, and with independence.

The cordial thanks of the meeting were given to the PRESIDENT for his interesting Address, with the request that it might be printed and circulated with the Rules, as explanatory of the objects of the Society.

The first ordinary meeting of the Society was held at the Town Hall on Tuesday evening, April the 7th; Mr. PARR, the President, in the chair. The attendance was good, more especially of the Associates.

Mr. J. H. ATHERTON (the Hon. Sec.) read over the minutes of the previous meeting.

The following gentlemen were unanimously elected Honorary Members:—

A. J. Bernays, Ph.D.	London.
T. Redwood, Ph.D.	,,
W. Wallace Fyfe, Esq.	Warminster.

The following donations to the Library since the last meeting were announced:—

Three vols. of Miller's 'Elements of Chemistry.' From Mr. Patchett.

The 'Pharmaceutical Journal' for April. From the Pharmaceutical Society.

Morfit's 'Chemical and Pharmaceutical Manipulation.' From Mr. W. H. Parker.

The 'Pharmaceutical Times.' T. A. Stephenson, Esq.

The Council placed upon the table the following works, purchased since the last meeting:—

Pereira's 'Materia Medica,' 3 vols.; Fownes's 'Manual of Chemistry;' Galloway's 'First Steps in Chemistry;' Stöckhart's 'Experimental Chemistry;' Sutton's 'Volumetric Analysis;' Johnson's 'Chemistry of Common Life;' Bird's 'Natural Philosophy;' Balfour's 'Manual of Botany;' Piesse's 'Art of Perfumery;' Fownes's 'Prize Essay;' Gibson's 'Agricultural Chemistry;' Beasley's 'Druggist's Receipt Book;' Bolley's 'Analysis;' Noad's 'Lectures on Chemistry;' Bernays, A. J., 'Household Chemistry;' Normandy's 'Handbook to Commercial Analysis;' Parrish's 'Practical Pharmacy.'

Mr. J. H. Atherton then read a paper on "Chloroform; its history, manufacture, adulterations, and impurities," making particular reference to the different methods used for purification, and also pointing out the simplicity with which the more general impurities and adulterations might be detected.

Allusion was also made to the so-called "chlorie ether," and the difference in the miscibility with water, between the solution of chloroform in eight parts of spirits of wine and the preparation sold by Messrs. Duncan, believing that the greater miscibility of the latter was due in a great measure to its greater dilution, and expressing a hope that in the forthcoming Pharmacopœia its composition would be definitely settled, and the best methods for its preparation, having due regard to its miscibility, would be adopted. The paper concluded by referring to the great benefits conferred upon mankind since its introduction, and that the gratitude of the medical profession and the world was eminently due to Dr. Simpson, as having been the first to introduce what has proved the most successful anæsthetic ever discovered. The subject was illustrated by diagrams.

A paper was afterwards read by Mr. J. Burton on "Unguentum Hydrargyri Nitratis." Particular reference was made to the purity and specific gravity of the acid used.

Several samples of the ointment were handed round, obtained from different shops in the town, some of which had a very questionable appearance, evidently not having been prepared according to the directions of the Pharmacopœia.

An interesting discussion took place after each paper, in which Mr. Parr, Dr. Popham Dr. Brookhouse, Mr. Atherton, and Mr. Beareroft took part.

The cordial thanks of the meeting were given to Mr. J. H. Atherton and Mr. Burton for their interesting papers.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., ETC.

(*Continued from p.* 407.)

X. PTELEA TRIFOLIATA, *LINN.*—SHRUB TREFOIL, WAFER ASH.

History.—Several parts of this plant are reputed to possess medicinal or other valuable properties. Thus, the fruit is very bitter and aromatic, and forms, it is said, a good substitute for hops; the young green shoots have been regarded as anthelmintic;* and the leaves and bark, more especially the bark of the root, are stated to possess stimulant tonic properties. The bark of the root is that portion of the plant which is alone employed by the Eclectic practitioners, and it is to that only our future remarks will more particularly apply. It is used principally as a tonic in remittent and intermittent fevers. It does not appear to be employed in any degree by the regular medical practitioners of North America; indeed, its use is even limited amongst the Eclectics. The recent introduction of it, and its oleo-resin (*Ptelein*) into this country as remedial agents, renders necessary a brief account of their origin, and of their chemical, physical, and other characteristics and properties, in the 'Pharmaceutical Journal.'

Synonyms.—This plant is the *Ptelea trifoliata*, Linn.; Mill. Ic. t. 211; Gærtn. Fr. t. 49; De Cand. Prod. vol. ii. p. 82; Torrey and Gray, Fl. N. Amer. vol. i. p. 215; Willdenow, i. p. 670; and of Lindley's Fl. Med. p. 215. It is the *Belluca trifoliata*, Adans. Fam. ii. p. 344. We adopt the former name as being that which is now almost universally employed by botanists.

* Lindley's 'Flora Medica,' p. 215; and Gray's 'Genera of the Plants of the United States,' vol. ii. p. 150.

In common language it is known under the names of Shrub or Shrubby Trefoil, Wafer Ash, Wing Seed, Hop-tree, Swamp Dogwood, etc.*

Etymology.—The name of πτελέα was originally one of those by which the Elm-tree was known. It was transferred to the present genus from the resemblance which its winged fruit bore to that of the Elm. The specific name *trifoliata* is derived from its trifoliate or ternate leaves. The common names by which this species is distinguished have been derived from its reputed properties, or from the characters presented by the fruit, or from the resemblance of its parts to those of other well-known plants, or from the nature of the situation in which the plant is found.

Botany.—The genus *Ptelea* has, at different times, been placed by botanists in various Natural Orders. It was included by Adanson in Pistaceæ; by Reichenbach, in Rutaceæ; by Jussieu, in Terebinthaceæ; by Kunth and De Candolle, in Pteleaceæ; by Nees and Martius, and by Endlicher, in Zanthoxyleæ; by Torrey and Gray, in Zanthoxylaceæ; and by Lindley, in Xanthoxylaceæ, in which Order, following him, we have placed it in our 'Manual of Botany.'†

Generic Character.—*Flowers* small, whitish, polygamous. *Calyx* 4–5-partite, much shorter than the corolla. *Corolla* with 4–5 spreading petals. *Barren flowers* with as many *stamens* as petals, to which they are alternate, as long or longer than the petals; *filaments* hairy at the base and thickened, hypogynous; *anthers* 2-celled, bursting longitudinally; *pistil* abortive. *Fertile flower*, with 4–5 very short stamens, with abortive anthers; *pistil* placed upon a short thick gynophore; *ovary* compressed, 2-celled, with two ovules in each cell. *Fruit* compressed, 2-celled, 1-seeded, round, indehiscent, membranous, surrounded by a broad reticulated wing. *Seeds* oblong. *Shrubs* or *small trees*, 3–5-foliolate, exstipulate.‡

Specific Character.—*Shrub* from about 6–8 feet high, unarmed. *Leaves* ternate or trifoliate; *leaflets* oblong or ovate-oblong, acute, sessile, downy beneath, obscurely crenulate or toothed, marked with pellucid dots. *Flowers* greenish-white, in terminal spreading corymbose cymes, having a powerful unpleasant odour. *Stamens* usually 4. *Style* short.§

Habitat.—This species is confined to the States of North America, where it may be found growing in moist shady rocky places, in the Middle, Southern, and Western States. De Candolle states that its range is from Carolina to Pennsylvania, and Torrey and Gray‖ describe it as inhabiting "shady rocky places, from Lake Erie to Florida, west to Kentucky and Texas." It flowers commonly in June.

Collection.—The root-bark, as already noticed, is the part commonly employed as a remedial agent. It should be collected for use in the autumn, or, still better, in the spring months, about March or April, according to the locality whence it is derived.

General Characteristics.—The specimen of Ptelea root-bark in the museum of the Pharmaceutical Society, which was presented by Professor Procter, of Philadelphia, in 1856,¶ is the only good one I have had an oppor-

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* A figure of the flowering branch of the *Ptelea trifoliata*, with drawings of the different parts of the flower, fruit, and seed, may be seen in Gray's 'Genera of the Plants of the United States,' vol. ii. plate 157.

† Lindley's 'Vegetable Kingdom,' p. 472; and Bentley's 'Manual of Botany,' p. 503.

‡ Lindley's 'Flora Medica,' p. 215; and Gray's 'Genera of the Plants of the United States,' vol. ii. p. 149.

§ Lindley, as above; Torrey and Gray's 'Flora of North America,' vol. i. p. 215; and De Cand. Prod. vol. ii. p. 82.

‖ Torrey and Gray's 'Flora of North America,' vol. i. p. 215.

¶ Pharm. Journ. vol. xvi. 1st ser. p. 272.

tunity of examining, and hence the following description is founded essentially upon its characteristics.

The bark generally is in more or less quilled pieces, though occasionally fragments may be found of a larger size scattered amongst the quills, which have an irregular, twisted, horny appearance. The quilled pieces are evidently derived from smaller branches than the larger irregular fragments. The quills are commonly single, but compound ones are sometimes found. They vary in length usually, from about one to three inches, the average being about two inches; but quills also occur as much as four inches in length, and others again which are less than an inch long. In diameter, they vary, from about that of an ordinary-sized goose-quill to that of the middle finger or thumb, the average size being about that of the little finger. In thickness, the bark varies from about one-eighth to one-fourth of an inch.

The colour externally, varies according to the size and other conditions of the quills. The smaller quills are commonly more or less covered with an ash-brown, or a somewhat silvery-looking periderm; but as this periderm is very thin and easily removed, we frequently find quills which are but partially covered with it; and in the larger quills, it is commonly in a great measure wanting. When the periderm is removed, the bark underneath has a yellow colour; hence the external surface of the commercial bark is of an ash-brown, or somewhat silvery, or yellow colour; or of a yellow colour, more or less mottled with brownish or silvery patches.

Externally, the bark presents irregular longitudinal striæ, and very evident transverse furrows and ridges. The latter are placed at varying intervals, being sometimes close together, and in other specimens some distance apart; at times these furrows almost surround the quills, so as to give them an annular or ringed appearance. Internally, the colour of the quills varies from a yellowish-white in the smaller quills, to a clear and distinct yellow in the larger ones. The inner surface is commonly smooth and somewhat soapy to the touch; but occasionally faint longitudinal markings are observed, which then give a corresponding rough character to the specimens in which they are found.

The fracture, both transverse and longitudinal, of all sized quills, as also of the irregular fragments, is more or less close, without the slightest fibrous appearance. The fractured surface is soft, easily indented by the nail, and of a yellow colour. The colour of the substance of the bark is more or less yellow. The bark has a somewhat spongy texture, and is light in weight. It has a peculiar bitter, rancid, pungent, and acrid taste; and a strong, peculiar, disagreeable, rancid odour.

Composition and Chemical Characteristics.—No complete analysis of Ptelea root-bark has as yet been made. Its examination formed the subject of a thesis by Mr. George M. Smyser, which was presented to the Philadelphia College of Pharmacy, in 1862.* From his experiments, Mr. Smyser concluded that it contained *vegetable albumen, gum, starch, volatile oil, fixed oil, extractive matter, a resinous substance soluble in ether*, and *a resin soluble in alcohol and ether;* and upon which, in connection with the volatile oil, the bark depended for its activity.

An infusion of the bruised root-bark of *Ptelea trifoliata*, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for twenty-four hours, had a pale yellow or straw colour; a strong, peculiar, disagreeable, and somewhat rancid odour; and a peculiar bitter, faintly acrid, and pungent taste. It exhibited the following reactions:—*Tincture of iodine* produced a clear deep bluish-green coloration, and no precipitate was formed after standing some time; *solution of persulphate of iron*

* 'American Journal of Pharmacy,' for May, 1862, vol. xxxiv. p. 198.

caused a slight brownish coloration, and ultimately slight opacity, but no marked precipitate; *solution of perchloride of iron* changed the yellow colour to an evident brown; *solution of acetate of lead* caused a plentiful yellowish-white, light, flocculent precipitate; *solution of basic acetate of lead* produced an abundant yellowish-white precipitate; *solution of nitrate of silver* had no evident effect at first, but it caused ultimately, a light, plentiful, yellowish-brown, somewhat flocculent precipitate; *solution of oxalate of ammonia* produced no apparent change at first, but the infusion soon became somewhat turbid and gelatinous-looking, and very slowly deposited a white precipitate; *solution of baryta* also produced no effect at first, except perhaps rendering the infusion a brighter yellow colour, but after a time an evident yellowish-white precipitate was formed; *solution of bichloride of mercury* produced a plentiful dirty-white precipitate; *solution of chloride of lime*, when first added changed the colour to a somewhat greenish yellow, then the colour of the infusion became nearly discharged, and ultimately, a light, crystalline, whitish precipitate was formed, which floated more or less on the surface. No very evident changes were produced in the infusion by the addition to it of either *blue or red litmus papers*, or of the *solutions of chromate of potash, ferrocyanide of potassium, nitrate of baryta, ferridcyanide of potassium, antimoniate of potash, carbonate of potash, sulphate of copper, bichloride of platinum, chloride of calcium, sulphate of lime, sulphate of soda, protochloride of tin*, or of *ammonia;* nor by *tincture of galls*, or *nitric, sulphuric*, or *hydrochloric acids*.

When a strong *solution of ammonia* was applied to the surface of a fresh fracture of the bark, or to a recently exposed portion of the inner bark, no effect was produced, except that the natural yellow colour of those parts became somewhat more evident. A nearly similar effect was caused by the application of *hydrochloric acid* to like parts of the bark. When *sulphuric acid* was added in a similar manner, the yellow colour generally of the bark became brighter, but more or less interspersed with brownish-coloured spots and streaks. By the addition of *nitric acid* to corresponding parts, the surface became at first of a brighter yellow than that of the natural bark, but spotted and streaked at intervals with a red tinge.

Medicinal Properties, Preparations, and Uses.—Nothing certain is known of the medicinal properties and uses of Ptelea root-bark, but it is evidently a substance of some power, and hence it is worthy of a trial in this country. At present, as before noticed, it has only been employed by the Eclectic practitioners, and even by them it is not generally in much repute. It is regarded as a stimulant tonic,* and has been employed principally in remittent and intermittent fevers.† Gray says ‡ that the bark and foliage are reputed to be anthelmintic.

There are no published formulæ for preparations of Ptelea root-bark, but amongst the American drugs and preparations presented to the Museum of the Pharmaceutical Society by Professor Procter, of Philadelphia, and of which a short description was published some years since in this Journal,§ is a substance called *Ptelein*, which is said to be the oleo-resin of the root-bark of *Ptelea trifoliata*, and described an Eclectic "active principle." It is a dark yellowish-brown extract, about the consistence of thin honey, having the peculiar odour of the bark, and a disagreeable, bitter, acrid, and pungent taste.

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* Pharm. Journ. vol. xvi. p. 272.
† Amer. Journ. Pharm. vol. x. 3rd ser. p. 198.
‡ Gray's 'Genera of the Plants of the United States,' vol. ii. p. 150.
§ Pharm. Journ. vol. xvi. p. 272.

ACCLIMATIZATION.*

BY MR. JOSEPH INCE.

Part I.—The Imperial Society of Paris.

Ten years ago, the subject of this Paper could have been discussed only in the pages of a zoological journal: within this brief period, the word Acclimatization has been invested with a far wider and truer meaning, and its study is connected with such a marvellous exhibition of progress that no pharmaceutist should remain ignorant of its details. The term *acclimatize* has ceased to be restricted to the introduction of a new animal to European soil; what is its later signification may best be gathered from the official records of the Imperial Society of Paris, of which there can be no happier summary than the opening speech of the President, Isidore Geoffroy Saint-Hilaire.

"We wish to found an Association, hitherto without precedent, that shall consist of agriculturists, naturalists, landed proprietors, and enlightened men, not only in France, but in every civilized country. Our design is to unite in furthering an object which truly needs the aid of every man, as it must conduce to the general advantage. It is no less than to people our fields, rivers, and forests with new inhabitants; to increase the number of our domestic animals, that first source of riches to the cultivator; to augment and vary our alimentary resources, which are at present so insufficient; to create new economical and industrial products, and thus to endow our languishing agriculture, our trade, our commerce, nay, society at large, with benefits hitherto unknown or neglected. These blessings will be no less precious hereafter than those which former generations have bequeathed to us. Such is the work you have not feared to undertake, and I hesitate not to say that if few are so difficult, none could be greater or worthier the age in which we live,—an age distinguished beyond all others for the splendid application of science to the welfare of the people."

These broad and enlightened views did not drop down upon Saint-Hilaire as a sudden inspiration: great men had been in the field before him ever since the time-honoured date of 1601, when Henry IV. and Olivier de Serres, in spite of the opposition of Sully, acclimatized the mulberry in France, introduced the silkworm, and laid the foundation for the lucrative industry of Lyons.

More recently, a great writer, and yet a practical man, broke through the routine monotony of the schools, and had his share in giving vitality to abstract science;—this was Buffon.

"We are far, very far," said he, "from using all the riches nature offers. She has given us the horse, the ox, the sheep, and all our other domestic animals for our use, our nourishment and clothing; she has yet other species in reserve to supply their lack; it is for us to tame and render them subservient to our wants. Man knows not sufficiently what nature can effect, nor his power over nature; and instead of seeking that of which he is ignorant, he turns into abuse the very knowledge he possesses."

Not content with theories or generalities, Buffon was no sooner made Director of the Jardin des Plantes (then called the Royal Garden of Medicinal Plants)

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* Authorities quoted:—

Bulletin de la Société Impériale d'Acclimatation. 9 volumes passim.
Annuaire id. id. 1863.
Acclimatation et Domestication des Animaux Utiles. (Isidore Geoffroy Saint-Hilaire.)
Musée des Familles. Paris.
Magasin Pittoresque. Paris.
Monde Illustré. Paris.
MM. A. Moquin-Tandon, Drouyn de Lhuys, et Rufz de Lavison.

than he set to work to change and amplify its whole organization. At this time it was nothing but a botanical garden, reserved exclusively for the cultivation of medical plants. "For a century," writes M. Drouyn de Lhuys, "no one dreamt of giving it any other destination." Buffon determined that it should be consecrated to the practical and theoretical study of all the productions of nature. But as this gigantic plan could not be successfully attempted by one single hand, since it would not be possible for an unaided worker to cope with its multifarious details, he chose (and the selection was most happy) two admirable assistants: Daubenton, to superintend the animal, and André Thouin, the vegetable kingdom. To these three we owe the creation of that magnificent establishment, the Museum of Natural History. Now mark the heritage of a great thought. Buffon, himself a genius, chooses two men, Daubenton and André Thouin, who both live to be known to fame. Daubenton, finding the details of his work beyond his grasp, chooses and adopts as his own son, Étienne (Stephen) Geoffroy Saint-Hilaire, who in turn, while yet a student, creates the Menagerie of Acclimatization (1793), whilst his master gives to France the race of merino sheep. Sixty years later, the son, Isidore Geoffroy Saint-Hilaire, inaugurates the Society of Acclimatization.

Let us make the acquaintance of the family.

Isidore Geoffroy Saint-Hilaire was born on December 16th, 1805; died November 10th, 1861, being scarcely therefore fifty-six years old. He was an hereditary zoologist, being born in the museum-house, and taking his first walks in those galleries that rose, as if by magic, under the direction of Cuvier and Jussieu. His father was Étienne Geoffroy, the founder of the menagerie. When nineteen years old, the son made his *début* before the scientific world by the publication of a memoir on a new species of Bat (*Nyctinomus Brasiliensis*), and at the age of twenty-one he published, in the Classical Dictionary of Natural History, his "General Considerations on the Class Mammifer." The main object of the essay was to resolve details into a uniform whole, and to deduce from isolated facts general conclusions. The texture of the skin of Mammifers; the variations of colour distinguishing one race from another; the influence of domestication on external character; the results of cross-breed between species and races,—conduct the young philosopher to comprehensive generalities which had escaped the notice of his predecessor. In 1832 appeared 'General and Particular History of the Anomalies of Organization.' The thought was new. He was the first to show that monstrosities, as infractions of special laws, did not exist, and he divided them into Classes, Orders, Families, and Genera. In consequence of these works, Geoffroy was elected a member by the Academy, being then twenty-seven years old. The great desire of his life was to write a "General Zoology," which resulted in the publication of his 'Histoire Naturelle Générale des Règnes Organiques.' Two volumes and the first part of the third were published, when the work was concluded by the great Finis, death.

The treatise was remarkable for the proposal of the "Human Kingdom," as distinct from the Animal, and containing one species, Man.

How admirable is the success attendant on the constant devotion to a single subject, the following list will show:—

In 1823 Geoffroy Saint-Hilaire was Bachelier-ès-Lettres.
,, 1824 Bachelier-ès-Sciences. Assistant Naturalist of the Museum of Natural History.
,, 1829 M.D. and Professor of Ornithology at the Museum.
,, 1830 Lecturer at the Athénée.
,, 1833 Member of the Institute (Académie des Sciences).
,, 1837 Professor at the Institute.
,, 1838 Dean of the Faculty of Sciences at Bordeaux.

In 1840 Inspector of the Academy. Inspector General of the University.
„ 1841 Succeeded to his father's place at the Museum.
„ 1854 President of the Society of Acclimatization.
„ 1858 President of the Académie des Sciences.
„ 1859 President of the Council of the Garden of Acclimatization.

In adition to which crowd of honours, he was a member of more than sixty learned societies, whilst the mere list of his publications extends over three and a half octavo pages of the Bulletin. Such a man is worthy of our attention, and it will not be idle to trace out some of the general features of his handiwork. Whilst an assistant at the Museum, so eager was he in pursuit of new specimens, and so successful in his search, that he was blamed for his want of arrangement in having overcrowded the galleries intended for the reception of animals and prepared skins. The evil speedily worked out its own cure in the shape of larger accommodation and more liberal space.

These Saint-Hilaires were a remarkable family,—for three generations they have lived for science. The father, Étienne, passed his life mentally and bodily in the Jardin des Plantes, the one bent of his aspirations being to develope the particular study which in him amounted to a passion. His treatise on Philosophie Anatomique concludes with this noble sentence:—"A feeling of devotion has ever sustained me in my undertakings. The most toilsome researches, the danger incurred, the warnings of my friends to keep aloof, —nothing has hindered me. I would fain hope that I may have, in truth, prepared the way for the least usefulness; though it bear fruit only in the distant future, I shall be satisfied. This is my only aim, I devote myself altogether to the Useful." The heritage of noble work was bravely accepted by the son, who carried forward and infinitely extended the father's views.

The quiet home at the Museum was destined to be strangely overshadowed. Étienne was seized with blindness, and soon afterwards died, and before Geoffroy could recover from the domestic stroke, he lost his wife, and then his sister. Overwhelmed by these family sorrows, he threw himself madly into work; overstrained by infinitely overtasking his powers. No wonder that he had to be sent to Switzerland to recruit his shattered health; the trip was unavailing, and on being brought back to Paris, he died as best befitted him, in the museum-house. His son, Albert Geoffroy Saint-Hilaire, has succeeded to his labours, and has already given promise that the hereditary honour of the family will suffer nothing in his hands.

In the list of the writings of Geoffroy Saint-Hilaire one has been intentionally omitted, 'The Domestication and Acclimatization of Useful Animals.' This being the grand point towards which all his investigations bore reference, the book itself brings us directly in contact with the subject now in hand. Up to this time Zoology had been too often considered a mere elegant accomplishment, fit to amuse the leisure of a contemplative philosopher and otherwise to improve his mind; it was now shown to have great utilitarian results, and that it might be presented in the shape of tangible advantage. Had Geoffroy laboured under the deep misfortune of being what is termed an eminently practical man, he might have lived content with the usual occupants of a farmyard and been thrown into ecstasies on the arrival of an additional calf. As it was, by taking higher, nay indeed the highest ground, he made his abstract studies subservient to the daily purposes of life. He did more; for he developed the resources, added to the convenience, and contributed to the commercial interests of his country as much as the most prosaic member of the community. As yet, we can notice but the dawning influences of his discoveries; his real title to honour will be the future.

The first positive result of his teaching was that it of necessity involved this fact, that Zoology, as a science, if meant to be studied in its widest and

broadest meaning, cannot stand alone. If by Zoology be meant a catalogue of various animals, each ticketed with an appropriate label, to which catalogue be appended a string of observations more or less correct, then of a truth it may be studied, as Goldsmith once wrote about it (Animated Nature) in the quiet of a parlour library; but if Zoology be meant to be something more than a theoretical routine book-classification, and have to include a personal and positive acquaintance with the habits and application of animal life, such as Buffon was the first to indicate, then we shall wake up to the reality of the pursuit; we shall need explorers, active and intelligent travellers, trusting to no other page than that of nature to see where these animals are, how they exist, what they do, what they produce, and whether it be not possible to utilize the knowledge gained by introducing these same animals to do the same work at home. The idea was at first deemed romantic, but it resulted in the establishment of the Zoological Society of Acclimatization, which was founded February 10, 1854. Geoffroy Saint-Hilaire was chosen President.

With regard to those plants on which especial cultivation is employed, De Candolle states that thirty-three species come from Northern Asia, three from Africa, forty from Southern Asia and from the Asiatic (intertropical) Archipelago; eleven from doubtful habitats in the Old World, two from North America, five also from America, region doubtful, and thirty-five species only can be claimed by Europe. It is therefore evident that the march of acclimatization is synonymous with that of civilization.

That the object was worthy the attention of a true philosopher will appear from a moment's consideration how miserably we should fare in Europe were we compelled to trust to our own national resources; once more we should have to dig up acorns, and to live by the produce of the chase. The vine comes from Asia Minor; the Romans brought as the spoils of war the peach, the cherry, and the apricot. Strange to say, no sooner did the Romans cease to be aggressive than they went back in civilization, and even lost their previous acquisitions. But, on the other hand, the Arabians established themselves in Spain and in the south of France, bringing thither, not only cotton (which they were the first to introduce), but the plants used at the present day in dyeing and in medicine. Rightly therefore, an Arab figures at the head of our pharmaceutical diploma, though, had the Romans been more immediately concerned with pharmacy, we might have had a more intelligible motto than "Habenda ratio valetudinis."

One year after the establishment of the society, the following decree was received from the Emperor:—

"Napoleon, by the grace of God and the national will, Emperor of the French, to all present and to come, greeting. On the report of our Minister, Secretary of State for the Department of Agriculture, Commerce, and Public Works, in consideration of the demand made by the Zoological Society of Acclimatization, with the advice of our Council of State, we have decreed and do decree as follows:—

"Article I.

"The Zoological Society of Acclimatization, whose head-quarters are established at Paris, is recognized as an establishment of public usefulness. The statutes of the said society are approved.

"Article II.

"Our Minister, Secretary of State for the Department of Agriculture, Commerce, and Public Works, is charged with the execution of the present decree.

"Feb. 26, 1855." (Signed) "Napoleon.

One month subsequent to this decree, the society was officially established on its right basis by the following notification :—

"By decision of his Majesty the Emperor, notified March 20, 1855, in a letter written by M. Dalmas (Under Secretary), the Zoological Society of Acclimatization is authorized to take the title of the Imperial Society, and to inscribe the name of his Majesty as Patron at the head of its members."

It had already been discovered that Zoology could form only a good starting-point for its operations; the title of Zoological sank into the smallest type, and was practically ignored. It was an honour to Zoology to link it with the brotherhood of kindred sciences, and from this moment Acclimatization, as a study, bore reference to every animal that walks the earth; to every fish that swims in the water; to every plant that grows for use or ornament; to every insect, bird, or creature whatsoever capable of being rendered subservient to the wants of men.

The Imperial Society of Acclimatization, after four years' existence, numbered about 1700 members, who resided in every part of the globe.* A double object was kept in view: (1) to contribute their store of whatever might be deemed useful to acclimatize in France; and (2) to indicate the peculiar wants of their own respective countries. Thus, in 1854, the society received half of the only herd of Yaks then come into Europe; thus, also, through the zealous agency of M. C. de Montigny, French Consul at Shanghai, (a name to be had in perpetual honour), aided by the missionaries, the Society received from China three vegetables—

1. L'Igname. *Dioscorea Batatas*, Chinese Yam.
2. Le Sorgho à Sucre. *Holcus saccharatus*, China Sugar-cane.
3. Le Loza (green colour of the Chinese).

In 1855 the society received two flocks of Angora goats. Sixteen were presented by Abd-el-Kader, and seventy-six were afterwards added. These goats are remarkable for the fineness and dazzling whiteness of their fleece. At the same date was received the first consignment of the *Bombyx Cynthia*, the silkworm feeding on the castor-oil plant. These silkworms proved a great success, and the account of the cultivation of them forms the basis of many papers contributed to the official journal, the 'Bulletin de la Société Zoologique d'Acclimatation.'

Many of the French missionaries in China, having now a definite aim for their researches, forwarded specimens of useful auxiliaries to their native land. Three times they sent cocoons of wild silkworms which grew in the open air upon the oak, using its leaf for food. With the silk obtained from these worms, which is both strong and abundant, are made the hard-wearing and brilliantly-coloured stuffs which serve to clothe more than 100,000,000 of Chinese. The two first importations met with accidents, with the exception of a few cocoons. However, with these few was demonstrated the fact, that not only could the silkworm be reproduced, but that it could also live in the open air on the oak-leaf exactly as in China. The third importation of these silkworms is still under observation. From the missionaries in China were received also—

1. The acorns of two kinds of Chinese Oak.
2. The seeds of the White Nettle (Ortie Blanche de Chine), from which they make stuffs more solid and more brilliant than those manufactured from our flax and hemp.

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* President, M. Drouyn de Lhuys; Vice-Presidents, Prince Marc de Beauvau, Moquin-Tandon, Antoine Passy, Richard (du Cantal); General Secretary, Count d'Eprémesnil. Each member pays:—1. An entrance-fee. 2. An annual subscription. The entrance-fee is at present ten francs which, in the case of future members, may be increased if so determined. The annual subscription is twenty shillings, or £10 paid down in lieu of all further demands. Professor Owen and Sir William Hooker are amongst the English members.

3. Oleaginous Peas, yielding excellent nourishment and abundant oil.
4. { The Wax-tree (Arbre à Cire) and
   { Varnish-tree (Arbre à Vernis).

M. C. de Montigny, of whom mention has been already made, was a whole society in himself. With a zeal that knew no limit and no weariness, and with a discernment worthy of all commendation, he set himself, in the leisure of his official duties, to forward animals, plants, seeds, together with raw and fabricated materials. Lastly must be mentioned the supply from America of potatoes from their original home, the Cordilleras, in the hope of recovering in Europe the pristine excellence of a tuber which too long culture and disease had materially affected.

I am compelled to omit, as unsuitable to the pages of this Journal, the introduction of the alpacas, the lamas, and the merino sheep, by whose means a new mine of wealth has been opened to the industry of France, the ultimate effect of which can only be surmised. As an incentive to individual exertion, the society offers three classes of rewards, open to universal competition. The prizes are awarded, irrespective of membership or nationality, to anyone who shall have merited the distinction;—

I. For the introduction of species, races, or useful varieties, whether of animals or vegetables.

II. For the acclimatization, domestication, propagation, and amelioration of species, races, or varieties, whether animal or vegetable; whether, secondly, adapted for useful employment, or simply accessory, or for ornament.

III. For the application, agricultural, industrial, medicinal, or otherwise, of animals or vegetables recently introduced, acclimatized, or propagated; or of their products. Encouragement by way of gift or prize is also offered for successful service rendered by those employed by the society, in addition to any salary they may receive.

Five similar societies have been established, namely, those of London, Glasgow, Palermo, Melbourne, and Sydney.

Up to this period (1850) the society had no garden, and had to trust to the zeal of its members to collect and protect the different animals they might possess, to sow the grains or seeds they might receive, and themselves personally and singly to cultivate and study the plants such seeds produced. Solitary study is generally of a very limited use; at all events, its scope is immeasurably widened by the power of association. In the present case the work was found disheartening; that practical experience, that is derived only from kindred thought and personal contact, was wanting in the system; besides which serious disadvantage, these isolated experiments were to a great extent shut out from the student and were altogether withdrawn from the observation of the public. Having raised Zoology into a reality, the society now found that a practical working laboratory was indispensable, and hence arose the necessity for a garden, more particularly as it was their object not merely to introduce a new specimen, whether of animal or plant, as a matter of curiosity, but to study it minutely, and discover the best methods of utilizing, ameliorating, and reproducing it. But the further result was scarcely anticipated, that Zoology and Botany should prove marvellous helpers to each other.

A concession was obtained from the city of Paris of a certain quantity of land, situated in the Bois de Boulogne, for "experiment and exhibition." The original grant was 15½ hectares (about thirty-eight acres), which was further increased by the Government to 20 hectares, making in all about forty-nine English acres. The organization of the Imperial Society did not allow it to direct an undertaking at once financial and scientific; therefore the ground was conceded on condition that an independent joint-stock company

under limited liability should be formed, separate in all respects save in its main intent from the existing society. Geoffroy Saint-Hilaire was chosen President of the Council; and thus rose that new ornament to the already brilliant city, the Paris Garden of Acclimatization.

26, *St. George's Place, Hyde Park Corner.*

SYSTEMATIC SCIENTIFIC INQUIRY.

BY R. REYNOLDS, F.C.S.

In an Address delivered to the British Association for the Advancement of Science at its meeting at Aberdeen (1859), the late lamented Prince Consort forcibly expressed a truth in the following words:—"Economy of labour is the essence of good husbandry, and no less so in the field of science."

My present object is to inquire how our own profession of pharmacy will be affected by the application to it of this aphorism.

That association is the first essential to economy of labour will be admitted. The main object of the British Association, as is admirably expressed by its constitution, is "to give a stronger impulse and a more systematic direction to scientific inquiry."

It is now thirty-two years since this Association was founded as the practical response to a general wish for organized effort amongst the cultivators of the natural sciences. Had some enthusiast proposed such a scheme fifty years earlier, how different would have been the result!

The sciences of chemistry, geology, meteorology, physiology, etc., could then hardly have been said to exist, and the first requirement as the basis of organization was to find a number of adepts in each science. This want fulfilled, organization became the next necessity.

Let us apply the parallel to pharmacy. Twenty-two years since, the Pharmaceutical Society was established, and its promoters were men who had faith to trace the connection between seed-time and harvest.

The Society furnished without stint educational agencies, and its leaders have always asserted that a regenerated profession could only be attained by training and educating a new generation.

What, then, are the fruits of twenty years' labour in this field? Have they furnished the required number of adepts to form organizations which shall economize scientific labour?

They ought to have done this, and I believe that they have done it. Four hundred members by examination have recruited the ranks of pharmacy; and what is also very important, the radiated influence of the Society has reacted upon many members of our trade who have not joined it.

Whilst appreciating every merit in established societies, and desiring to uphold and conserve them, it is right that we should also consider if there are any points in which their practice may be improved, and their efficiency increased.

A society may be doing much good, but still not be using that economy of labour to which Prince Albert alluded.

Taking up the 'Pharmaceutical Journal' for March last, I find reports of two meetings of that excellent Society the Liverpool Chemists' Association, which is the model of provincial societies. At one meeting, the paper of the evening was upon "Granite," at the next upon "Electric Discharges *in vacuo*." A knowledge of both these subjects is interesting and desirable; but whilst encouraging lectures upon subjects of allied science, I think we must take care of the main object of our professional societies, which should be the systematic cultivation of pharmacy.

Your leader this month, entitled "Do they manage things better abroad?" challenges reflection as to the perfect working of our own system. Allow me to point out that your comparisons are entirely European in their scope, and ignore the existence of that great nation in the western hemisphere, whose system of pharmacy is the direct offspring of our own. Our habitual neglect of the progress of pharmacy in America has not escaped notice. Professor Parrish writes: "It is a subject of remark by pharmaceutists in the United States, that their contributions to knowledge are less sought out and copied into the English and Continental journals than the interest and importance of some of them seem to demand." ('Chemical News,' Dec. 6, 1862.)

If, therefore, the question be repeated, "Do they manage things better abroad?" I unhesitatingly say that there are points in which we might advantageously follow our American brethren, and I appeal to the literature of the subject for the proofs of this assertion.

Ten years since, there was established in the United States the American Pharmaceutical Association, which holds annual meetings, but varies the place of meeting like our British Association.

The best idea of its labours will be obtained from its published Proceedings.*

It is almost needful to take the Proceedings for 1859 as a specimen, since those of subsequent years have hardly reached England. The library of the Pharmaceutical Society contains also the volume for 1860, but no others.

The following is an outline of the contents of the Proceedings for 1859:—The Members of the Association are about four hundred, the attendance at Boston being between fifty and sixty. It is not surprising to find that some apothecaries have been enrolled—hence the introduction of therapeutics on some occasions; but after this explanation, no further allusion to this point is needful.

The main operations of the Association may be said to depend upon the annual arrangement of a series of subjects for investigation.

Forty-four questions were thus settled, as being points requiring to be cleared up, and each was "accepted" by a member for investigation and report to the next meeting.

The following are specimens of the queries:—

"13. Paraffin has been suggested as a substitute for wax in cerates. *Question.*—Are there any therapeutic objections to this substitution: and if not, in what proportion should it be used as a substitute for wax in cerate?"

"21. What is the best test of the therapeutical value of extract of Indian hemp, that may be applied by the apothecary without resorting to its internal exhibition?"

Twenty-three reports on subjects allotted at the last meeting, or since volunteered by members, occupy 120 pages. Amongst these reports are the following:—"On the action of oxide of silver with organic matter;" "On the deposit in Ipecacuanha Wine;" "On the deterioration of the druggists' stock, and the best means of preventing it," etc.

Four committees presented reports upon the following subjects respectively:—"On the progress of pharmacy;" "On weights and measures;" "On the revision of the Pharmacopœia;" "On home adulterations."

The vital importance of the last subject need hardly be enforced. There is sufficient work for a standing committee upon adulterations in our own country. The International Exhibition has just shown us a collection of pre-

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* Proceedings of the Amer. Pharm. Assoc., 1859, pp. 416. Messrs. Morgan Bros., Bow Lane, have a few copies of this handsome octavo volume, and charge them at only two shillings each.

parations which may fairly be taken as a standard of what such things ought to be. This display, however, is mere optimism, if we ignore the fact that drugs reaching this standard form but a fraction of the total supply. A collection of bad and adulterated drugs would be far more useful, to serve as warnings to us.

An invaluable feature of the Proceedings is the publication of a section which forms a year-book of pharmacy, both home and foreign.

The reference of questions in science to individuals and committees for report is no new idea. It forms a main feature of the operations of the British Association, for instance. In 1844, Pereira introduced the proposal to form a Natural History Committee of the Pharmaceutical Society, and many members will recollect that such a committee was established. It is especially to be noted that Pereira also said: "It will be obvious, that several committees, having for their common object the advancement of chemistry and pharmacy, might with great propriety be established; thus, one on pharmaceutical chemistry."

The Pharmacological Committee elicited some contributions of facts during the succeeding two years, but its duties essentially consisted in drawing up queries and suggestions for travellers in foreign lands. This condition of things must have detracted from its permanency.

The practical conclusion which I desire especially to urge is this: that we should collectively determine what subjects to investigate. It is probable that the plan of relying upon an individual member for the reply to a query is preferable in most cases to referring it to a committee.

It is hardly possible to leave the subject without alluding to the question whether peripatetic gatherings would be advantageous to our provincial members.

Several years since, Mr. Schacht, of Clifton, proposed such meetings, and I find that his opinion of their desirability continues unaltered. Mr. Schacht states that he would object to the formation of any new organization, regarding the existing means at the disposal of the Pharmaceutical Society as being capable of direction into such a channel. Into this feeling I can thoroughly enter. Our London brethren have chiefly maintained the scientific meeting of the Society for many years. The provincial constituency is four times as numerous, and may fairly be called upon to exert a more systematic effort than at present. I would suggest that the coming meeting of the British Association at Newcastle-on-Tyne, in August, would afford the opportunity of testing upon a small scale the feeling towards such gatherings. Many pharmaceutists attend the meetings of the Association, and it would not be difficult to devote a day to a conference amongst these.

Whilst I gladly avail myself of this opportunity of indorsing Mr. Schacht's views with reference to provincial meetings, I may be allowed to point out that there is no necessary connection between this subject and that of organized and scientific inquiry. We may introduce the latter into our existing societies without even altering a rule.

The Leeds Chemists' Association has elected as Corresponding Members several pharmaceutists residing in neighbouring towns where no organization exists. We hope that these gentlemen will join us in advancing pharmaceutical science by undertaking subjects which the collective body has indicated as demanding investigation.

Any Society successfully doing this work will have succeeded in "giving a stronger impulse and more systematic direction to scientific inquiry."

Leeds, April 13th, 1863.

ANALYSES OF ALBERT COAL AND BOGHEAD CANNEL.

BY WILLIAM KING, ESQ.

Read at a Meeting of the Liverpool Chemists' Association, March 12th, 1863.

The following analyses have been made for the purpose of determining the value of the coals in respect to their gas-producing power.

Analysis of a sample of Albert Coal from New Brunswick, specific gravity (water 1·0) 1·092 :—

Ash	0·31 per cent.
Volatile products	61·90 ,,
Coke, per ton	875 lbs.
Purified gas, per ton	14,300 cubic feet
The purified gas contained—	
Matter condensed by bromine	28·0 per cent.
Carbonic oxide	1·4 ,,

The illuminating power when the gas was burnt at the rate of four cubic feet per hour in a bat's-wing burner (which is the burner generally used for cannel gas) was equal to the light of 34·35 spermaceti candles, each consuming 120 grains per hour ; or five cubic feet will give a light equal to 42·94 such candles.

Analysis of a sample of Boghead Cannel, specific gravity (water 1·0) 1·244 :—

Ash	30·16 per cent.
Volatile products	59·20 ,,
Coke, per ton	915 lbs.
Purified gas, per ton	13·600 cubic feet.
The gas before purification contained—	
Sulphuretted hydrogen	0·6 per cent.
Carbonic acid	2·2 ,,
The purified gas contained—	
Matter condensed by bromine	24·8 ,,
Carbonic oxide	5·3 ,,

The illuminating power of the gas, when burnt at the rate of four cubic feet per hour in a bat's-wing burner, was equal to the light of 32·88 spermaceti candles, each consuming 120 grains per hour ; or five cubic feet gave a light equal to 41·1 such candles.

Offices of the Liverpool United Gas-Light Company, Newington Street, Liverpool, March 27th, 1863.

THE INTRODUCTION OF NEW REMEDIES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

I have no doubt there are many of my fellow members who can fully endorse the remarks recently made by Mr. Deane at one of the monthly meetings, with respect to the introduction of new combinations of medicinal substances. The London chemist suffers much inconvenience by the appearance of these complicated remedies in prescriptions ; but it bears no comparison to the delay and expense involved by the provincial chemist if he is to faithfully carry out the instructions of the physician.

The evil does not end here. A country patient consults a London physician, who thinks proper to prescribe one of these new compounds, and who, in many instances, sends the prescription to a London chemist. The patient returns to

the country, and has his medicine prepared by his own chemist, who may have the new preparation in stock; but how is he to know whether it is by the same maker, and, consequently, of the same colour and strength, as that prepared by the London chemist? Some of these new combinations differ so much in colour and strength, that I know of many instances where chemists get into unmerited disgrace simply because the prescription faithfully dispensed by them is so widely different to that prepared elsewhere. I have at this moment three different samples of citrate of iron with strychnia, as unlike each other in appearance as they are almost possible to be: the question is, which am I to use? One professes to contain one grain of strychnia in one hundred grains of the salt, another contains one grain in one ounce, whilst the third does not apparently know its own strength.

Then there are the superphosphates of all sorts of bases; to be obtained either as separate salts or three or four combined with sugar, forming a compound syrup. This may be all very well, providing you could ensure something like a similarity in their appearance and strength; but "there's the rub," for if you obtain them from three or four different houses you get as many dissimilar compounds, both as regards colour and strength, and I may add consistency, so that I have no doubt but that my fellow-members can bear testimony to the fact that the introduction of many of these compounds is a source of great inconvenience, expense, and disappointment. To give an instance of the uncertainty in the strength of one of these preparations, I would just mention that a friend of mine, who doubted the quantity of strychnia in some citrate of iron with strychnia, gave some to a dog,—the quantity given should have contained *one grain* of strychnia,—it produced no effect, and yet the next day he gave the same dog *half a grain* of the alkaloid alone, and the dog was dead in a very short time.

WILLIAM YATES BREVITT.

Wolverhampton, April 14th, 1863.

[We entirely agree with our correspondent, that the increasing practice of introducing new remedies, prepared according to private formulæ, is the source of much inconvenience to chemists, whether of London or the country. —ED. PHARM. J.]

A DISPENSER'S DIFFICULTY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

As an illustration of the difficulties sometimes attending the responsible duties of the dispensers of medicines, I beg to hand you the following for insertion in the Journal, hoping that a knowledge of the fact may enable some of my brethren to avoid a dilemma likely to damage their reputation as chemists and dispensers, beside the pecuniary loss attendant on a withdrawal of custom and confidence.

The following prescription is the source of the trouble referred to:—

℞ Acid. Phosphor. dil. ʒiv.
Ferri Citrat. Ammon. ʒj.
Æther. Chlorie. ʒj.
Syr. Simpl. ʒij.
Aquæ ad ʒvj.

This was taken to the shop of Mr. A., who made a *thick* mixture, which was objected to by his customer, who stated that Mr. B., Mr. C., and others, had made it repeatedly, and that it was always *clear*. Suspecting the phosphoric acid to be in some way connected with the difference, he sent to the shop of Mr. B. for a small quantity, with which, to his astonishment, he made

a clear mixture. On further examination, it appeared that the acid Mr. A. had used was a trifle over the strength indicated in the London Pharmacopœia, while that of Mr. B. was but two-thirds what it ought to be. The former caused a large precipitate of phosphate of iron, the latter no more than the water could hold in solution. Both chemists dealt with manufacturers of the first respectability and integrity, who would be above the petty meanness of intentionally sending out the article deficient in strength, but they were evidently not alike careful to test the strength of their acids before supplying them to their customers, hence this unpleasant difficulty; and Mr. A., who prided himself on the purity and integrity of everything supplied at his counter, had his reputation seriously risked, if not permanently damaged; for who can reason with a customer under such circumstances? A bare assertion will have little force with the evidence of two or more to one against him. It is not always practicable to test the strength and quality of every chemical compound that comes into our stock. Every one must of necessity rely chiefly on the honour and character of the manufacturer, yet it is most desirable that every dispenser of medicines should occasionally test such articles as dilute phosphoric acid, according to the simple instructions given in the Pharmacopœia; it would serve the double purpose of keeping up his own knowledge, and making the manufacturer a little more careful on his part.

The above prescription may be a very efficient one in the hands of the physician who wrote it, but its rather incongruous character led to the useful but unpleasant discovery just related, and shows to what difficulties a dispenser may be exposed, and on what a slender thread his reputation hangs, even when conscientiously using the purest chemicals.

I ought to state, the circumstance did not occur in my house; but when my attention was drawn to it, I thought it desirable to examine the case for myself. On repeating the experiments, I found that the weaker acid—diluted to the proper bulk—did not make a perfectly clear mixture; and further, that when the acid of full strength was used, and diluted with three parts of water, and very gradually added to the solution of the ammonio-citrate of iron in the remainder of the water, the precipitate of phosphate of iron was not nearly so great as when the acid was added undiluted; the resulting mixture was very similar in appearance to, but not quite identical with, that made with the weaker acid,—a fact which shows very forcibly what is well known, how the mode of mixing may influence the result.

A further source of confusion may arise from the uncertain composition of Ferri Citras Ammon., which varies both in solubility and in the quantity of ammonia it contains. In one experiment I obtained the most satisfactory mixture by adding a few drops of Liq. Ammoniæ to my somewhat difficultly soluble ammonio-citrate of iron before adding the phosphoric acid. Dilute phosphoric acid is now frequently made by dissolving glacial phosphoric acid, made from phosphate of ammonia, in water; the article thus made is of course more entirely free from traces of nitric acid than that made according to the Pharmacopœia process.

HENRY DEANE.

Clapham, April, 1863.

LICENSE FOR THE USE OF A STILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—Will you allow me space in your Journal to state, for the information of your readers, that having attached a pipe to my kitchen boiler, and connected therewith a small condensing apparatus for the purpose of

supplying myself with pure water for business purposes, I am compelled, in consequence, to take out a still license?

I appealed, but in vain, to the Commissioners of Inland Revenue to exempt me from the imposition of the tax.

Probably some of my brother chemists are turning to the same practical account the waste steam issuing from their safety-pipes; if so, let me advise them to take out licenses forthwith, lest they experience, what I have, an unexpected visit from an officer of Excise.—I am, dear Sir, yours truly,

THOMAS BURDEN.

6, *Store Street, Bedford Square, April 9th*, 1863.

PROVINCIAL EXAMINATIONS FOR ASSOCIATES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Those who are acquainted with the early history of our Society, know well that two very different courses were marked out for it. One party recommended that the fee for membership should be high, and that, in fact, it should be a kind of club for the few wealthy and scientific members of our body, which might take action when any important legislative measure made its appearance, and round which, as the head, the chemists of Great Britain might rally. They argued that all attempts to make it general would fail, that chemists would not support it, that the managers would only have obloquy for their pains, and that their most disinterested efforts and exertions would only be attributed to a desire for private advantage. Another party advocated broader and more liberal counsels, and determined to bear the usual misrepresentation which falls to the lot of public men who desire to work out a general improvement. They resolved to aim steadily at raising the qualifications, and therefore the character, of the pharmaceutists of the nation; to seek, by counsel, by providing education, and by procuring all the incentives which they could persuade the public to bestow and the legislature to grant, to make the pharmaceutists of the nation fit for their responsible position, and so to take away the inducement which from time to time arose to harass and trouble them by ill-considered and injurious legislation. And no man who is aware of the difficulty of such a work, in a free land like this, and with a public ready to take alarm easily, but slow to bestow confidence, will refuse to acknowledge that very much has been accomplished, and that much of a great work has been well and wisely done. One of the greatest difficulties which we have now to contend with, is that of carrying out our influence into those parts of our country which are distant from the metropolis, and into the smaller towns and districts, where changes slowly penetrate.

Whilst connection with the Society is *purely voluntary*, and the advantages from it may not be at *once* obvious, there will always be a disinclination to join it on the part of many, particularly when the seat of its operation is far away. And if we add to this that the instruction is somewhat costly, whilst many of our trade are poor, that competition is sharp and remuneration scanty, and that the recognition of the distinctive title by the public is as yet very imperfect,—all this will explain the reason why great numbers of chemists are still unconnected with our Society. But it is our wisdom to remedy this, if possible, not only because our object, that of national pharmaceutical improvement, is so far unaccomplished, but also because those who are outside of us are, for their own sakes, hindrances to us in our attempts to obtain superior advantages to those who bear our name.

Now, in order to meet these difficulties, are there not two objects to be

sought? First, to make union with the Society and improvement in pharmacy as easy and inexpensive as possible; and, secondly, to offer an inducement to those who cannot afford that course of instruction which we should desire, and which would make them accomplished chemists, yet to fit themselves by a lower degree of attainment for a creditable discharge of the duties devolving upon a chemist and druggist.

I am sure that the attainments required at our *minor* examination are such as are quite within the reach of any industrious young man who has been apprenticed in a good shop of business, and who has made a proper use of his time. There is nothing required which such a young man ought not to be quite ready to answer; and I hear from our examiners that many of those who pass the most creditable minor examinations are those who come up from the country at the close of their apprenticeship. But to many the journey to London is an expense unwillingly incurred, and more would think about this examination, and prepare for it and pass it, if it were brought nearer to them. I therefore propose that the Council should be requested to appoint local examinations in some of the chief towns of England, such as Manchester or Liverpool, Newcastle, Birmingham, Bristol, Exeter, etc. These might be held once a year; resident chemists might be found who would act under the warrant of the Council, with the President or Vice-President presiding. All necessary drugs and chemicals could be obtained on the spot, or borrowed from Bloomsbury Square, and the names of the successful candidates sent up to London for approval. I believe that the examination thus brought home to those who are now indifferent would create an interest in the Society and its objects, which would be most beneficial alike to the public, the young men, and the Society itself.

Out of those who might thus pass with little cost the minor examination, we should have a considerable number of the best and most energetic who would qualify themselves to pass the major, and thus take their place with honour amongst the members of our Society. But there might still remain a large number (so long as examination is a voluntary thing) of those who would be unwilling to meet the expense and devote the time generally necessary either at the Society's laboratory, or at some other school of chemistry, so as to qualify themselves for the major. These will say that the character of business, which they will probably have to get a living by, does neither afford scope for much scientific acquirement nor require it, and that to come up to London and study would involve an outlay which they cannot afford, and see no need for. And yet these men will ever form a large proportion of the chemists scattered throughout the land; and it is highly important that they should have the amount of information required by our minor examination, both for the credit of our name, and for the sake of the public whose lives are entrusted to their skill. Now, I believe that if the passing of the minor examination not only gave the title of Associate of the Pharmaceutical Society, whilst a young man remains out of business, but also if such a person were allowed to retain it and exhibit it if he pleased after he went into business, even should he not see fit to go further, a very great inducement would be offered to all industrious young men to pass the minor and become connected with the Society; whilst the *élite* would go on to further study, and exhibit the title "Pharmaceutical Chemist" as their mark of superior rank.

Our annual meeting approaches, and a larger number than usual of country members will probably be in town; it will be a fitting time for discussion, and this has led me to bring the subject before you, that if such views as those I have advocated should commend themselves to the approval of the members generally, they may be represented to the Council.

I am, Sir, yours faithfully, OPIFEX.

ON CINCHONINE AS A SUBSTITUTE FOR QUININE.

In the 'Pharmaceutical Journal' for February last, I observe an interesting paper by Mr. Joseph Ince, recommending the salts of cinchonine in lieu of those of quinine; now so far as my experience extends with reference to the employment of cinchonine in the treatment of febrile and other miasmatic diseases of Western Africa, it has proved a decided failure, owing to the headache which has uniformly attended its administration. When I was in medical charge of the troops in Sierra Leone, a large quantity of cinchonine was furnished to the hospital with the view of testing its remedial properties, and also of ascertaining whether it would not answer as an economical substitute for quinine. It was therefore given to both European and negro patients who were suffering under the milder forms of remittent and intermittent fevers, and free from any local congestions, in the ordinary doses in which the sulphate of quinine was used. The results of the trial were, however, of such an unsatisfactory character, from the pain and cerebral congestion induced, that the medicine had to be discontinued. It was subsequently combined with calomel and morphia, but without any sensible diminution of the cerebral disturbance. When conjoined with the latter, delirium sometimes set in, which was only relieved by the application of blisters to the neck. With these drawbacks, therefore, cinchonine can never be resorted to as an efficient substitute for quinine in the treatment of tropical diseases.—*Extract from a Letter to Professor Bentley, from Dr. W. F. Daniell, Kingston, Jamaica, March 24th*, 1863.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

Chemistry of Commercial Aniline.*—Dr. Hofmann has been engaged in investigating into the nature of the less volatile liquids which are produced during the manufacture of aniline upon the large scale. These liquids commence to boil at 182° C., and the temperature continues to rise, without indicating any fixed point, until the limit of the mercurial range is reached, and it is necessary to remove the thermometer from the retort. Collecting separately that which distils between 200° and 220°, and that which passes over between 270° and 300°, basic oils are obtained, consisting chiefly of toluidine and toluylene-diamine. Separating that which distils above 330°, a thick brown liquid is obtained, which, treated with dilute sulphuric acid, furnishes a crystalline mass, containing two salts,—the one soluble, the other remarkable for its insolubility. The *soluble* sulphate, when separated and decomposed by caustic soda, gives a viscid basic oil, which becomes solid in the course of a few days. This, purified by compression between bibulous paper and crystallization from water and from alcohol, furnishes long white silken needles, which are little soluble in water, very soluble in alcohol and ether, fuse at 192°, and distil, without decomposition, at a temperature beyond the range of a mercurial thermometer. This body possesses precisely the same composition as aniline, and is therefore named by Dr. Hofmann *Paraniline*. It forms definite, well-crystallized salts, the study of which has indicated that this base should be represented by the formula $C_{12}H_{14}N_2$, that is to say, double that of aniline.

Paraniline is capable of fixing either one or two equivalents of acid. The monoacid compounds are obtained with great facility; they possess a fine yellow colour. Dr. Hofmann describes the sulphate, the nitrate, the hydrochlorate, and the platinum salt.

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* Dr. Hofmann uses the new equivalents, in which C=12 and O=16, and in this and the following article his formulæ have been retained unaltered.

The *insoluble* sulphate obtained at the same time as the soluble sulphate, by treating the bases distilling above 330° with dilute sulphuric acid, may be purified by boiling with alcohol, in which it is insoluble, and dissolving in very large quantities of boiling water, filtering, and crystallizing. To isolate the base, this sulphate is suspended in weak alcohol, and submitted to the action of caustic soda, when a solution is obtained which deposits on the addition of water the new base, in the form of white scales, little soluble in boiling water, very soluble in alcohol and ether, fusing at 45°, and boiling at 322° without alteration. This base has the composition $C_{12} H_{11} N$, and constitutes a primary monamine—

$$C_{12} H_{11} N = \left.\begin{matrix} C_{12} H_9 \\ H \\ H \end{matrix}\right\} N$$

The author proposes for this base the name *Xenilamine* (from ξενος, stranger), on account of the obscurity of its origin.

The Chemistry of Aniline Colours.—It will be remembered that some time back* Dr. Hofmann made a most interesting investigation into the nature and composition of magenta, and succeeded, through the instrumentality of Mr. E. Nicholson's manufacturing skill, in demonstrating that this magnificent dye really consists of a salt of a new base, to which he applied the name of *Rosaniline*. From rosaniline he at the same time obtained another and homologous base, which was christened *Leucaniline*. Mr. Nicholson has since placed in the hands of this distinguished investigator a yellow colouring-matter, which is obtained as a secondary product in the manufacture of rosaniline. This body communicates a golden-yellow tint to silk and wool; it occurs in the form of a yellow amorphous powder, resembling chromate of lead; it is difficultly soluble in water, but very soluble in alcohol and ether. This substance constitutes another well-defined base, giving two series of readily crystallizable salts. Dr. Hofmann proposes to designate this base *Chrysaniline*. Its most characteristic compound is the proto-nitrate, which is sparingly soluble in water; treated by ammonia it furnishes pure chrysaniline, which, when dried at 100° C., has the formula $C_{20} H_{17} N_3$.

Hydrochlorate, $C_{20} H_{17} N_3 2H Cl$.—This salt occurs as a scarlet crystalline precipitate, formed of scales, which are very soluble in water, less soluble in alcohol, almost insoluble in ether. When maintained during fifteen days between 160° and 180° C., it is changed into a yellow powder, which constitutes the mono-acid hydrochlorate $C_{20} H_{17} N_3, HCl$.

Nitrates.—These are magnificent salts, crystallizing easily in needles of a ruby-red colour, and remarkably insoluble in water. A dilute solution of nitre (containing 1 gramme of nitric acid to a litre of water), when mixed with a moderately concentrated solution of a salt of chrysaniline, gives a crystalline precipitate so readily, that this base may serve as a reagent for the detection of nitric acid. The two nitrates have the formulæ respectively of $C_{20} H_{17} N_3 HNO_3$ and $C_{20} H_{17} N_3 (HNO_3)_2$. It is difficult to obtain the one of these free from small quantities of the other.

Sulphate.—Very soluble; crystallizes with difficulty.

Platinum salt.—Crystalline scarlet precipitate, which is deposited in very fine large tables, containing a mixture of the mono-chloroplatinic and the dichloroplatinic salts, fixing more or less water of crystallization.

The composition of chrysaniline establishes a direct relation between this substance and rosaniline and leucaniline :—

Chrysaniline	$C_{20} H_{17} N_3$.
Rosaniline.....	$C_{20} H_{19} N_3$.
Leucaniline	$C_{20} H_{21} N_3$.

The first is mono-acid or diacid; the second is mono-acid or triacid, but it possesses a very decided tendency to function as mono-acid; the third forms exclusively triacid compounds.

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* See Pharmaceutical Journal for May, 1862 (vol. iii. p. 570).

ON THE USE OF MEDICATED PESSARIES IN THE TREATMENT OF UTERINE DISEASE.

BY THOMAS HAWKES TANNER, M.D., ASSISTANT-PHYSICIAN FOR THE DISEASES OF WOMEN AND CHILDREN TO KING'S COLLEGE HOSPITAL, ETC.

The great value of a variety of local applications in the treatment of uterine disease seems to be insufficiently appreciated by the profession at large. This is somewhat strange, considering the time which has elapsed since Dr. Simpson specially directed attention to their exceeding utility. Yet it is certain that a large number of practitioners know of no agents which may be directly applied to the uterus and vagina save the various kinds of eausties and injections. The latter are certainly of great benefit in many cases; but it must be allowed that, even when properly used, they are often of only temporary service, since they cannot be kept in contact with the diseased part for more than a few minutes.

The chief reason, I believe, for the non-employment of medicated pessaries has been the difficulty of so making them that they can be efficiently applied by the patient herself. When formed of certain drugs mixed into a mass with lard and wax, they are either so soft that the sufferer cannot introduce them into the vagina; or, on the contrary, they are so hard that they fail to dissolve, and are expelled in just the same condition as that in which they were introduced. Although I have now employed these agents very freely for some years, I have found very few druggists who would take the trouble so to make them that they were of any service. The difficulties just alluded to have, however, been overcome since Mr. White Cooper directed attention ('Lancet,' 28th June, 1862) to the utility of the butter obtained from the *Theobroma Cacao* nut, from which chocolate is made, as the basis for ophthalmic ointments. This material possesses many valuable qualities, the chief being these:—It has an agreeable smell, and does not soil the fingers when handled; it does not become rancid; while, more particularly, though very firm, it has the property of becoming fluid at a low temperature. It is sometimes a little too stiff, but this fault is readily obviated by combining with it a little olive oil or glycerine. Pessaries made with cacao butter, though they have the consistence of wax while cold, are dissolved in the course of a few minutes when introduced into the vagina.

If ophthalmic surgeons are much indebted to Mr. White Cooper for directing attention to the uses of this butter, obstetric physicians are under no less an obligation. For although it had been used in America for making ointments for some time before this gentleman wrote of its merits, yet no physicians in this country were acquainted with its value, as far as I can learn from many inquiries.

The following formulæ for medicated pessaries are given as examples of the way in which I generally prescribe these remedies. It is only necessary to premise that rather large doses of the different drugs are necessary, inasmuch as absorption through the walls of the vagina is slow and uncertain:

1. *Iodide of Lead and Belladonna Pessaries.*—℞. Plumbi Iodidi, ℈ij; Extracti Belladonnæ, ℈j; Butyri Cacao, ʒiv; Olei Olivæ, ʒj. Misce. Divide into four pessaries, and order one to be introduced into the vagina every night or every other night.

2. *Mercurial Pessaries.*—℞. Unguenti Hydrargyri, ℈iv—ʒij; Butyri Cacao, ʒiv; Olei Olivæ, ʒj. Misce. Where there is tenderness of the cervix uteri, one scruple of extract of belladonna or two scruples of extract of conium should be added to the mass. Divide into four pessaries.

3. *Lead and Opium Pessaries.*—℞. Plumbi Acetatis, ℈j; Extracti Opii, gr. xij; Butyri Cacao, ʒiv; Olei Olivæ, ʒj. Misce. Divide into four pessaries. Order one to be used every other night.

4. *Zinc and Belladonna Pessaries.*—℞. Zinci Oxydi, ʒj; Extracti Belladonnæ, gr. xij—℈j; Butyri Cacao, ʒiv; Olei Olivæ, ʒj. Misce. Divide into four pessaries. One to be used every night.

5. *Iodide of Potassium and Conium Pessaries.*—℞. Potassii Iodidi, ʒj; Extracti Conii, ℈iv; Butyri Cacao, ʒiv; Glycerinii puri, ʒj. Misce. Divide into four pessaries, and direct one to be used every night.

6. *Tannin and Catechu Pessaries.*—℞. Tanninæ, ℈ij; Pulveris Catechu, ʒj; Butyri Cacao, ʒiv; Olei Olivæ, ʒj. Misce. Divide into four pessaries, and order one to be used every other night.—*Trans. Obstetrical Society of London.*

WHOLESALE CHARGES.

(*From the 'Répertoire de Pharmacie,' February*, 1863.)

Our readers will scarcely be prepared for the stringent regulations enforced abroad of which a fair sample is presented in the following trial. The preliminary remark of the editor of the Répertoire seems not out of place. "I am convinced that the monopoly enjoyed by the pharmaceutist from his diploma is one of the safeguards of the public health in France, and that it is much better to shut the door to collateral professions than to open them. We have neither the manners nor customs of the English; that which may be tolerated with impunity in Great Britain, would be very dangerous amongst us. On the other hand, when we have exacted from the pharmaceutist the strictest guarantees of every kind, why should we positively garotte him, and prevent him altogether from taking the initiative?"

Preparation of Pharmaceutical Products by a Wholesale Druggist.—This is a trial which determines an important point in pharmaceutical jurisprudence. In 1861, the School of Pharmacy laid an information that M. Mauprivez, druggist, not a recognized pharmaceutist, manufactured and sold lozenges of Calomel, Sulphur, Ipecacuanha, and Bismuth. An action was immediately brought against him (under the Police Act), in which Messieurs Blondeau, Roche, and Colas, Paris Pharmaceutists, specially engaged in the manufacture of medicated lozenges, appeared as Civil prosecutors. Notwithstanding a report drawn up by M. Reveil, the Eighth Court, as also (on appeal) the Court of Correctional Police, acquitted M. Mauprivez, on the ground, firstly, that the preparations employed in the composition of his lozenges amounted to no more than a simple chemical operation; and secondly, that the lozenges thus made were only simple drugs, and not pharmaceutical compounds. The Court of Cassation, April 3, 1862, reversed this judgment, considering that the distinction established between chemical and pharmaceutical operations implies a contradiction in terms, so far as to exclude chemistry from pharmacy; that it moreover applies to the processes employed for the preparation or the composition of medicinal remedies a distinction which does not exist in the law; and that this distinction is all the less admissible, inasmuch as that which the legislature had in view was to prevent the free introduction into commerce of those products that were destined to serve as medicinal remedies, whatever might have been the process by means of which they had been obtained.

The case having been referred to the Court of Orleans, M. Campenon, counsel for the Society of Privileges of the Paris Pharmaceutists, demanded the annulling of the judgment of the Eighth Court, alleging the importance of the question raised. "This is no mere case of the seizure of some lozenges, or of such and such a remedy," said he; "a principle is at stake. We have to learn whether the preparation of officinal remedies is in the domain of the public; whether the diploma of the pharmaceutist, indispensable for the sale of medicaments, is not even more indispensable for their preparation; whether, lastly, we can establish a distinction between chemical and pharmaceutical preparations, when the result is the same, to produce a remedial agent, and when there is the same ultimate intention, to cure a patient." Article 33 of Law Germinal, An II., forbids the preparation or compounding of pharmaceutical remedies in the case of wholesale druggists, and even the sale of simple drugs by medical weight.

Now, what has M. Mauprivez done? He makes (in order to sell again to pharmaceutists) a set of lozenges, which, according to the Codex, ought to contain a definite quantity of Calomel, Ipecacuanha, or Sulphur: that is selling by medical weight; and although in the making of these lozenges no recourse was

had to (pharmaceutical) preparation, though they might be deemed a simple body, that alone would serve to establish the culpability of M. Mauprivez. But is it not evident that to wash Sulphur, bruise Ipecacuanha, reduce Bismuth into a subnitrate, to form Calomel by sublimation, to assign a dose to the products thus obtained, to mix them with a definite quantity of sugar and mucilage, and thus to prepare lozenges ordered in the Codex and possessing therapeutic value, is to make both pharmaceutical preparations and compounds?

On all these points judgment is delivered. The Court of Cassation considers the fact of reducing the cinchona bark into powder as a pharmaceutical preparation (Sept. 9, 1813). The Court of Bordeaux declared (July 7, 1841) that Ipecacuanha in powder and pulverized Jalap are equally pharmaceutical preparations, the sale of which is forbidden to wholesale druggists. As to medical weight, the High Court has defined it as the dose in which a medicament should be employed (June 26, 1825). As to the definition given by the tribunal of the operations in which M. Mauprivez has been engaged, it cannot stand. Every pharmaceutical operation is of necessity chemical, and pharmacy has no pretensions to be a science so distinct from others. Chemistry studies the laws of bodies, their composition and decomposition; pharmacy applies these laws to therapeutics. It is in fact chemistry applied to the art of healing.

M. Mauprivez has therefore violated the law, he is only a wholesale druggist. He can only grind simple substances wholesale. If there had been found on his premises Sulphur or Ipecacuanha as they exist in commerce, no action would have been brought; but he has submitted these natural products to a modification, which, by law, is the prerogative of pharmacy alone. Hence this action and the lengthy trial, which interests all pharmaceutists in the highest degree; and hence, lastly, the necessity for a severe condemnation.

M. Grandmanche, counsel for M. Mauprivez, maintained that in adding sugar and bark, substances without therapeutic virtue, to simple substances such as Ipecacuanha and Sulphur, his client had not overstepped the duties of a wholesale druggist, who has full power to sell all simple substances. The wholesale druggist is perfectly justified in purifying substances of this kind. For else what would he sell? Nature does not produce drugs. He added that M. Mauprivez did not sell retail, offered nothing gratuitously to patients, and that by medical weight, the law understood sale in medical quantities and for therapeutical purposes. Lastly, what risk did society incur? M. Mauprivez manufactures for pharmaceutists; all his products therefore are introduced into the trade under the sanction of a diploma.

The judgment of the Supreme Court was confirmed. Verdict against M. Mauprivez. Fine, and damages with costs.

NOTE ON THE PROXIMATE PRINCIPLES OF SOME BERBERIDACEÆ AND RANUNCULACEÆ.

BY FERDINAND F. MAYER.

Since the discovery of the yellow alkaloid berberina in a new family, the fourth (*Berberidaceæ*, *Menispermaceæ*, *Anonaceæ*, and *Ranunculaceæ*) and most extensive, it was to be presumed that other genera of these Natural Orders, especially those distinguished by rhizomes of a yellow colour, would prove to owe the same to the presence of that alkaloid. In fact, some time after I began the examination, of which this is intended as a preliminary notice, I ascertained that my friend and colleague, J. M. Maisch, had intimated as much in regard to *Coptis trifolia*,* and that the editor of

* Buchner's Neues Repertorium f. Pharmacie, Band xi. July, 1862.

this Journal had satisfied himself likewise on the same point, so that I can only confirm a prior statement.

There is present besides in the rhizome of the gold-thread a colourless alkaloid, which, like Durand's Hydrastia, is not precipitated by hydrochloric or nitric acids, and is separated in the same manner. For this, as well as for several other colourless alkaloids, occurring in company with berberina or otherwise in the families named, we must refrain from establishing new names until their relation to the other colourless alkaloids of the same families (*Oxyacanthia*, *Pelosina*, *Menispermia*), and to *Hydrastia*, has been defined.

From the late Jonathan Pereira's description of the root of *Coptis Teeta*,* there remains little doubt but that the plants of this genus have a similar composition.

In *Berberis vulgaris* the yellow alkaloid was discovered by Brandes in 1825; but neither he nor Buchner and Herberger,† who gave the first analysis of the plant, noticed its true character. This was established by Buchner, sen. and jun.,‡ and afterwards by Fleitmann.§

Curiously enough, the same volume (iii.) of the Journal of the Philadelphia College of Pharmacy, in which is noticed the essay of Buchner and Herberger, and also the discovery of columbine in the root of *Cocculus palmatus* (Natural Order *Menispermaceæ*), by Wittstock, contains a paper on an American *Berberidacea*, the *Podophyllum peltatum*, in which a bitter principle is described, which, from the few data given by the author, Mr. William Hodgson, junior, could only have been the yellow alkaloid of that family.

This substance, which received the name of *podophyllin*, was obtained by the same process by which berberina is still extracted from the vegetables containing it, *i. e.* by decoction in water, and purification of the extract with alcohol. It was not freed from adhering brown resin, nor was its character as alkaloid noticed; but its bitterness, its solubility in cold water, and precipitation by hydrochloric acid, were mentioned by Mr. Hodgson.

The rhizome of the May-apple contains both berberina and a colourless alkaloid, a resin, a free acid, a neutral odorous substance volatilizable in white scales, and *saponin*.

When the alcoholic extract of the rhizome is freed from alcohol, and then mixed with water, the latter dissolves the acid, a considerable quantity of berberina, and saponin, together with some resinous matter. The precipitate left after washing with water, the so-called resinoid *podophyllin*, is a mixture of a resin and the volatile principle, which are soluble in ether, and a portion soluble in alcohol, which is the other alkaloid in combination with saponin and brown resinous matter.

The wash-water or supernatant liquid from the precipitation of the impure resinoid contains berberina and saponin, besides free acid. The alkaloid can be precipitated by lead or by acids. When the liquid is reduced to the consistence of a thin syrup, and on cooling mixed with water, impure saponin is precipitated in considerable quantity.

The rhizome of another plant belonging to this family, and used in the Eclectic practice, *Jeffersonia diphylla*, twin-leaf, contains a small quantity of berberina, a larger proportion of a white alkaloid, and a considerable amount of saponin. The presence of alkaloids in this plant is indicated by the reactions obtained by Professor Bentley,‖ in the aqueous decoction with iodine, tannic acid and corrosive sublimate.

Mr. E. S. Wayne, who has examined this plant,¶ mentions a bitter principle and an acrid acid. The pectin found by him is saponin. It forms a still larger proportion of the soluble constituents of the rhizome of *Leontice* or *Caulophyllum thalictroides*, Blue Cohosh.

The alcoholic tincture of this rhizome left to spontaneous evaporation, deposits a

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* Pharm. Journ. Trans. xi. 294. Mishmee teeta, Mahmira, probably the same as mentioned by Paulus Ægineta, Actuarius, Avicenna, Rhazes, Ibn Baitar; *Chynlen* (Guibourt, *Histoire Naturelle des Drogues*.

† Buchner's Repert. xxxvi. p. 1 (1830).—Journ. Philad. Coll. iii. p. 173.

‡ Buchner's Repert. lii. p. 1, xciv. 176; Ann. Chem. Pharm. xxiv. p. 228.

§ Ann. Chem. Pharm. lix. p. 160.

‖ Pharm. Journ. and Trans. (2) iv. p. 106.

¶ Am. Journ. Pharmacy, vol. xxvii. p. 1.

white granular substance in considerable quantity. No berberina is present, only a yellow colouring-matter. The deposit washed with dilute acid, which dissolves a colourless alkaloid and soluble extractive, and then with some water, remains as a greyish-white powder, which, for the greater part, consists of *saponin;* and this, together with a portion of the alkaloid, constitutes the so-called caulophyllin of Eclectic pharmacy.

These are not the first plants of the Order of *Berberidaceæ* in which saponin has been found. The *Leontice leontopetalon*, Linn., known to be used in the Orient for washing, etc., is mentioned by Th. Martius* among the plants containing that principle.

Its presence in these American plants will account for some of the acrid properties ascribed to their preparations.—*Amer. Journ. Pharm.*, March, 1863.

ON CHESTNUT-LEAVES IN WHOOPING-COUGH.

BY GEORGE C. CLOSE, OF BROOKLYN, N. Y.

I wish to call the attention of members of the Association to an article, not recognized in the Pharmacopœia, and the use of which as a medicine has only recently come to my knowledge.

This article is the leaf of the common Chestnut-tree (*Castanea vulgaris*).

Having a child whom I supposed to be affected with incipient whooping-cough, I asked a prominent physician of New York, who has had an extensive practice for more than thirty years in the city, what he thought was the best remedy for whooping-cough? He answered, "Chestnut-leaves are by far the best remedy I have ever met with." Upon this, I immediately commenced giving to the child an infusion of the leaves made with boiling water and sweetened with sugar. She drank it freely and without objection, the taste not being unpleasant. The cough, which had continued for two weeks, and was evidently growing worse previous to giving the remedy, was immediately relieved, and after two or three days ceased entirely, and has not returned, though several months have passed.

Since making this trial, when asked by customers, "What is good for whooping-cough?" I have advised them, if they had no physician in attendance, to try the leaves. In several instances after trying them, they have reported to me that "they acted like a charm," and gave immediate and great relief.

I have also heard of cases of adults, who were affected with that kind of spasmodic cough which is sometimes caused by some (perhaps slight) source of irritation in the throat, being immediately relieved by the same remedy.

As I have occasionally calls for chestnut-leaves, I asked a person who applied for them a few days since, for what purpose he used them? He replied, as a remedy for whooping-cough, for which they were very good, and that they often relieved other kinds of cough also. This shows that their use is becoming somewhat popular as a domestic remedy.

A very extensive use of an article is required, however, to test its real value as a remedy, and I only present the foregoing facts as warranting, in my judgment, further trials of the leaves.

I also present a specimen of the dried leaves procured green and cured by myself, and a sample of fluid extract made from the powdered leaves in the usual way, using diluted alcohol as a menstruum.

Although the use of chestnut-leaves as a remedy is new to me, it may not be to all the members present, and if any of them can give further information upon the subject, I hope they will do so for the benefit of the Association.—*Proc. Am. Pharm. Association*, 1862, *and Amer. Journ. Pharm., Jan.* 1863.

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* Buchner's Neues Repert. vol. xi., August and September, 1862.

ON THE CALABAR BEAN AS A NEW AGENT IN OPHTHALMIC MEDICINE.

In the Pharmaceutical Journal, vol. xiv. p. 470, will be found an interesting paper by Dr. Christison on the general properties of the "Ordeal Bean of Old Calabar," and quite recently D. Argyll Robertson ('Edinburgh Medical Journal,' March, 1863) has investigated its properties as a new agent in ophthalmic medicine. D. Robertson observes:—For more than a year past I have recognized the numerous advantages that would flow from the discovery of a substance which, when applied to the conjunctiva, should produce effects exactly opposite to those well known to result from belladonna or atropine; which should stimulate the muscle of accommodation and the sphincter pupillæ as the above-named remedies paralyse them. With the view of discovering such an agent, I endeavoured to ascertain from experiments of my own, and from the writings of previous observers, whether any of the common vegetable principles possessed this property. These investigations were, however, productive of no satisfactory results, until my friend Dr. Fraser informed me that he had seen contraction of the pupil result from the local application of an extract of the ordeal bean of Calabar. I resolved to investigate the action of this substance, and, above all, to ascertain whether it exerted any influence on the accommodation of the eye. With some difficulty I got a few Calabar beans, and, with the view of obtaining their active principles in a convenient form, prepared from them three extracts, of varying strengths, in the following manner:—The weakest of the three was made by thoroughly digesting gr. xxx of the powdered Calabar bean in alcohol, carefully evaporating the strained fluid to dryness, and then adding to the residue ʒj of water. This formed a muddy solution, of a light reddish-brown tint. In strength, one minim of this solution corresponded to about half a grain of the bean. The second extract was formed by evaporating a portion of the first to about a quarter of its volume; so that one minim of this extract corresponded to about two grains of the bean. The third extract was the strongest, and was prepared like the first, except that the proportions differed; so that one minim of it in strength corresponded to four grains of the bean. With these solutions, I then proceeded to perform the following experiments,—in which I had the able assistance of Dr. Grainger Stewart,—with the intention of elucidating the exact effects the Calabar bean is capable of producing on the eye.

Several experiments with this agent are then described, the details of which are too exclusively medical for our pages; but the following are the conclusions arrived at by the author:—"These experiments prove that the local application of the Calabar bean to the eye induces—first, a condition of shortsightedness. That this is present, and the cause of the indistinctness of distant vision cannot be doubted, as it is relieved by the use of concave glasses. The fact that objects appear larger and nearer than natural may be attributed to the induced myopia. And, second, it occasions contraction of the pupil, and sympathetically dilatation of the pupil of the other eye. We further observe that atropine possesses the power of counteracting its effects, and, *vice versâ*, that it is capable of overcoming the effects produced by atropine. The first symptom noticed is dimness of distant vision, and shortly after the pupil becomes contracted; the symptoms also subside in the same order,—first the derangement of accommodation, and then the affection of the pupil."

ON THE EARTH-EATERS.

In a recent meeting of the Geographical Society, M. Cortambert gave some interesting details of some tribes of the Upper Orinoco, Rio Negro, etc., who are earth-eaters—that is to say, who have the singular habit of eating earth. This edible earth is a kind of clay containing oxide of iron, and has a reddish-brown colour. They knead it into little cakes or balls, which are dried, and afterwards baked when required for the purpose of eating. It is a stay for the stomach rather than a nourishment, and not generally used but in times of scarcity. This clay has such an action on the stomach, that Indians have been known to exist for entire months without any other resource. They sometimes fry it in a kind of oil, and then it may to some extent

be really nutritious. It is not uncommon to meet with individuals whose taste for the clay is so decided, that they may be seen at times detaching pieces of it from habitations in which it has been employed in building, and devouring it greedily. All kinds of earth have not, however, the same charm for their palate; they taste it, and distinguish in it very different qualities. Some white people in Venezuela have imitated the earth-eaters, and do not despise balls of fat earth.—*Moniteur Universel; et Gazette Médicale d'Orient.*

ENGLISH INK-GALLS.

At a meeting of the Exeter Naturalists' Club, held in Exmouth, Mr. D'Urban read a paper on the "English Ink-Galls." Most persons, he said, must have noticed the hard brown galls, about the size of musket balls, so conspicuous in winter on the Oaks about Exeter. They are supposed to have made their first appearance in Devonshire about the year 1847. They were first noticed by Mr. Parfitt, who sent specimens of the insect causing them to Mr. Westwood, in 1848 or 1849. It has only lately, however, been determined to be *Cynips Kollari* of Hartig. a species well known in Germany. About three years ago, it suddenly appeared in the woods to the north of London in vast numbers. It is closely allied to *Cynips gallæ-tinctoriæ*, producing the ink-gall of commerce on *Quercus infectoria* in the Levant. The galls of the Devonshire species contain a considerable amount of tannin,* making excellent ink, and yielding a good and permanent dye. Like all other insects which multiply rapidly, it is subject to the attacks of a parasite, which contributes to keep its increase within certain limits. This is a beautiful green chalcite, first bred from these galls by Mr. Parfitt, and described by him in the 'Zoologist' for 1856 under the name of *Callimome Devoniensis*. Mr. D'Urban did not think that the galls occasioned much injury to large Oaks, but to young trees they are very injurious, frequently distorting the leading shoot, and seriously retarding its growth. They make their appearance on the Oaks in this neighbourhood early in July, and growing rapidly, reach their full size in August. They are formed on the young shoots of the year, always in the centre of a bud, and are monotholasmous, that is, they contain a single individual only. Some of them produce the flies in September, nearly all being females. The males are remarkably scarce, and have but rarely been obtained. Some remain in the larva state within the gall all through the winter, and emerge in the spring. Few, however, of those hybernating escape the different species of tit, those little birds picking the hard galls to pieces to get at the fat white grub inside. The galls themselves are very persistent, remaining for several years on the trees. Those from which the fly has escaped may readily be known by the presence of a single round hole on one side. Mr. D'Urban then explained the manner in which galls are formed, and the mechanism of the instrument with which the gall-fly makes a puncture in the bark of the trunk or shoots, in the young bud, on the leaf, or on the peduncles of the flowers, according to the part of the tree selected by a particular species, of which a great many infest the Oak.—*Gardeners' Chronicle.*

BOTANIC GARDEN OF THE SOCIETY OF APOTHECARIES.

We are glad to find that the authorities of the Society of Apothecaries are anxious to make their garden at Chelsea more valuable as a means of instruction than it has been of late years. With this view they have issued the following letter to their members, and we hope that it will be cordially responded to. The Members of the Society of Apothecaries have always been foremost amongst the medical examining bodies in this country in promoting the study of botany as an important branch of a medical education, for which they deserve much credit:—

* This result of Mr. D'Urban does not accord with the experiments of Dr. Vinen (Linn. Soc. Proceedings, vol. 1st, Zoology, p. 72) and of Mr. Braithwaite (Pharm. Journ., vol. xv. p. 544), both of whom found but a very small amount of tannin in these English galls.—Ed. Ph. Journ.

"The members of the Society of Apothecaries, from the earliest period of its history, have taken a very lively interest in the pursuit of botanical knowledge. Very shortly after their incorporation in the reign of James I., we find them engaging in periodical botanical excursions in the neighbourhood of London; and so early as the year 1632, the Society's 'Herborizings' had become an established annual custom.

"Thomas Johnson, the learned editor of Gerarde's 'Herbal,' and an honoured member of the Society, has left a most graphic account of several of these early excursions, proving not only the devotion to botany of the 'Socii itinerantes' themselves, but the extent to which that devotion was shared by the Society at large. The interest thus awakened seems to have strengthened with time, for within half a century of their incorporation, the Society were able to secure for their members increased opportunities for the prosecution of their favourite study, by acquiring a botanic garden of their own; and the reality of this interest is strongly proved by the fact, that the means for the formation and early support of the garden were provided by the members from their private resources.

"It was under these circumstances that, in the year 1673, the Society of Apothecaries became lessees of between three and four acres of land on the bank of the Thames, at Chelsea, and at a very considerable expenditure enclosed the ground, and adapted it for the purposes of a botanic garden.

"Such was the origin of the Society's garden at Chelsea, which was the first garden in the neighbourhood of the metropolis established by a public body, and exclusively devoted to the advancement of botany as a science. For nearly two centuries have the Society maintained this garden at a great charge, and frequently under circumstances involving considerable personal sacrifices on the part of the individual members; but on no occasion on which a strenuous effort has been necessary to preserve the garden for the purposes to which it was originally destined, have the members of the Society been found deficient in the liberality and zeal which characterized their early predecessors.

"The Society have sought and received their reward in the assistance which they have been able to render to the general advancement of botanical science, and more especially in the opportunities afforded to successive generations of medical students, for the prosecution of this branch of their professional studies. Nor have there been wanting great and good men (not belonging to their own body) who have encouraged and aided the Society in their efforts to extend the benefits of sound botanical knowledge. In the year 1721, Sir Hans Sloane (at that time President of the Royal College of Physicians), who had become the purchaser of the land under lease to the Society, conveyed the garden to the Society in perpetuity, 'to the end that the said garden might at all times thereafter be continued as a physic garden, and for the better encouraging and enabling the Society to support the charges thereof, for the manifestation of the power, wisdom, and glory of God in the works of creation.'

"For some years past, the Society have had to contend with numerous difficulties in their efforts to preserve the garden in full efficiency. On the one hand, the expenses of its cultivation have pressed heavily on the resources of the Society, and on the other, the increase of buildings and manufactories in its neighbourhood, and the threatened inroads of railway companies, have created a feeling of discouragement, and even of doubt, as to the course which the Society should pursue with reference to its continued maintenance. When the executive of the Society, however, reflected how much benefit the garden had conferred in times gone by, with what pride it had been cherished by their predecessors, and, above all, when they found how numerous a body of the medical students of the metropolis were still anxious to profit by it (no fewer than 500 students having applied for admission during the past summer), they unanimously resolved that the garden should be continued, and that a vigorous effort should be made to render it as efficient as possible for the fulfilment of the important objects to which it has been so long devoted.

"In order to carry this resolution into immediate action, it has been determined, in addition to other arrangements:—1. To make a new and as complete a collection as possible of all medicinal and economical plants. 2. To enlarge the collection of the more important hardy herbaceous plants, arranged according to the natural system. 3. To convert the old lean-to houses into 'aspects of the vegetation of tropical and

temperate climes.' 4. To make two divisions in the span-roof house for plants requiring various degrees of heat and moisture. 5. To construct a cold house, or mere glass shelter, in order to show experimentally the value of such protection in cultivating plants in a town atmosphere. 6. To construct and plant examples of Wardian cases, in illustration of their utility in cultivating, as well as in the conveyance of plants to and from distant countries. 7. To build a new room for the use of the assistant gardeners, and to provide the same with suitable books, specimens, etc., for their instruction and amusement.

"The members of the Society will learn with great satisfaction, that in carrying out the above objects the Society will have the benefit of the valuable advice and superintendence of their colleague, Mr. Ward.

"The Master and Wardens invite the cordial co-operation of their brethren in their endeavour to render their establishment at Chelsea worthy of the Society as a scientific body, and they venture to suggest a mode in which valuable aid may be afforded, viz. by assistance in the completion of the various collections of plants. Such individual members as may be able to assist in this respect, either personally, or through the agency of correspondents or relations abroad, will greatly oblige the Master and Wardens by so doing.

"It is hardly necessary to add that it is intended to render every facility to professors of botany and their pupils making use of the garden in its renovated form."

MISCELLANEA.

The Pharmacopœia.—Dr. Burrows and Dr. Farre, the one a member of the Medical Council, and the latter a member of the Pharmacopœia Committee, both said a few words, at the last meeting of the College of Physicians, on the subject of the Pharmacopœia. Dr. Burrows did not give a hopeful account of its progress. He said that the determination come to in favour of the old-fashioned grain had caused a great deal of new work to be encountered, viz. the conversion of the Committee's new-fashioned grain back into the old style. He, however, believed that the work was in progress, and had been much advanced. It appears that every alteration has to go the circuit of the three kingdoms; to be subjected, in fact, successively, to the Irish, Scotch, and English criticisms of the three sub-committees, sitting respectively in London, Edinburgh, and Dublin. This process, of course, gives rise to interminable alterations, suggestions, recommendations, joinders, rejoinders, replications, and so on. Dr. Burrows said also that a part of the manuscript was actually in print; but that as to when the work would appear he could give no opinion.

Dr. Farre, however, who, being on the Committee, should know most of the matters, gave a more hopeful view of things. He seemed to think that there decidedly was a chance of the work seeing the light during the present generation. The chief, in fact the only, cause now of the delay was the circuit of the manuscript through the three kingdoms. He assured the College that the Pharmacopœia was steadily progressing; that a part of it was in print; and that the remainder was rapidly getting into the same state. It does not appear, by the way, that the delay has injured the College's pecuniary interests; for the Treasurer remarked that during the past year the College had netted £26 by the sale of Pharmacopœias of the old kind.—*Brit. Med. Journ.*

Alleged Death from Morphia.—An inquiry respecting the death of Mr. John Cordery, of Burnham, Bucks, has been held before Mr. F. Charsley, coroner. It appears that the deceased was attended by Mr. Gillam, surgeon, of Burnham, who, on Wednesday, February 25th, sent a powder, which was taken on the same night, and early in the morning he complained of a peculiar sensation, and soon afterwards his wife found that he was insensible. Mr. Gillam was sent for, whose efforts to restore animation proved unavailing, and the patient died about eight o'clock. A certificate of death from disease of the heart was subsequently given by Mr. Gillam, but this not being satisfactory to the widow was the cause of the present inquiry. A *post-mortem* examination was made, and the contents of the stomach were analysed by Dr. Taylor, who, however, failed to detect any morphia; but was still of opinion that the symptoms

and appearances described were such as would be produced by a dose of morphia. According to the evidence of Mr. Gillam, he prescribed half a grain of hydrochlorate of morphia in the form of a powder, and a mixture composed of squills, sesquicarbonate of ammonia, and gum arabic. Mr. Gillam was requested to produce his book in which prescriptions were entered. This corroborated Mr. Gillam's statement; but above this entry was seen what appeared to be an obliteration of a former entry, and this it was found impossible to decipher. Thomas Hooker, the servant of Mr. Gillam, stated that he saw his master weigh the powder which was sent to Mr. Cordery; it was weighed from a bottle, divided in halves with a knife, one half was folded in paper and the other half returned to the bottle. The coroner, pointing to some powder on a piece of paper, requested the witness to remove with a knife a quantity as nearly equal to the powder sent to Mr. Cordery as he could. Of course, this mode of estimating the quantity was objected to on the part of the gentleman who appeared on behalf of Mr. Gillam. After a fourth adjournment of the inquiry, the jury were unable to come to a unanimous verdict; the coroner therefore determined to take the finding of each juryman separately, in order to obtain the opinion of the law officers of the Crown. All the jurymen, excepting one, were of opinion that death was caused by hydrochlorate of morphia; but there was a difference of opinion as to whether sufficient caution had been exercised in the administration of the remedy.

Alleged Attempt to Poison by Corrosive Sublimate.—On Monday, March 27th, Kate Richardson, aged eighteen, was tried at Lewes, before the Lord Chief Justice, on the charge of "feloniously causing to be taken by William Halsted and Martha Halsted a certain poison called corrosive sublimate, with intent, wilfully and of malice aforethought, to kill and murder them, or so as to endanger their lives or do grievous bodily harm." The evidence adduced failed to connect the poison in any way with the accused, or to show any sufficient motive for the alleged crime; the only motive suggested by the prosecution being, that shortly before the poison was found in the beer, the prisoner had received notice to leave the service of her master, Mr. Halsted. A portion of the beer was analysed by Dr. Letheby, who found it to contain corrosive sublimate, and a bottle of liquid found on the premises proved to be a concentrated solution of the same poison. The jury found a verdict of "Not guilty" on the charges.

Glycerine Plasters. — At a meeting of the Obstetrical Society of London, March 4th, Dr. Tilt drew attention to the fact that when 100 or 150 grains of common starch are boiled in one ounce of glycerine, the result is a very stiff glutinous compound,* which has no smell, and does not become rancid, and although sticking firmly to the skin, it can be removed and reapplied. Instead of ordering belladonna plaster, Dr. Tilt prescribes three grains of sulphate of atropine to be rubbed down with a few drops of glycerine, then incorporated with one ounce of hard glycerine ointment, and thickly spread by the patient on gutta-percha cloth, or impermeable cloth. Morphia and other alkaloids are prescribed in the same way.

REVIEW.

THE PHARMACOPŒIAS OF THIRTEEN OF THE LONDON HOSPITALS arranged in Groups for easy reference and comparison. By PETER SQUIRE, F.L.S., etc.

This little work contains the formulæ used at the principal London hospitals. Every medical man has peculiar formulæ, which he is accustomed to prescribe in the treatment of particular diseases, so that there might be a Pharmacopœia for every practitioner, which would comprise the prescriptions he is in the habit of writing. At the public hospitals, instead of each of the physicians and surgeons in attendance using his own formulæ, all those attached to a particular hospital agree to use one set between them; and these being entered in a book, with a distinctive title to each, much

* [A similar preparation, as a proposed substitute for oils and fats, was first introduced by Mr. Schacht, of Clifton, and published in this Journal, vol. xvii. p. 400.—ED. PH. JOURN.]

economy of time is effected, both in prescribing and dispensing, for the principal medicines being kept in stock, it is only necessary in ordering any one to write the title under which it is inserted in the book, and only necessary in dispensing it to transfer the medicine, ready-made, from the stock-bottle to the patient's vial. Thus, *Haustus Ammon. Comp.; Haustus Antim. c. Opio; Linimentum Saponis c. Cantharide; Mistura Æther. c. Lobelia,* etc. etc., are titles under which certain combinations of medicines are used at some of the London hospitals. Most of the hospitals have their special formulæ printed, and these are called the Pharmacopœias of the hospitals. Mr. Squire has taken the pains to collect and arrange the formulæ of thirteen of these, and the work may be useful in two ways:—it contains a large number of prescriptions which have been sanctioned by many eminent physicians and surgeons, and which, on this account, some medical men may be glad to refer to; and it will occasionally be useful to chemists, to whom a hospital prescription may be brought, ordering such medicines as those already alluded to.

BOOKS RECEIVED.

The Nature and Treatment of Gout and Rheumatic Gout. By Alfred Baring Garrod, M.D., F.R.S., etc. Second edition, enlarged and carefully revised, 8vo, pp. 618. London: Walton and Maberly. 1863.

TO CORRESPONDENTS.

Roskestel (Torquay).—Apply by letter to Mr. Bremridge, 17, Bloomsbury Square.

Exot. (Hertford).—(1.) We should think there would be few Spanish, Italian, or French chemists requiring English assistants, and we know not where a person seeking such an engagement should apply. We do not know what salaries are given. (2.) Philosophical Magazine, published monthly, price 2*s.* 6*d.*; Journal of the Chemical Society, monthly, price 1*s.*; Chemical News, weekly, price 4*d.*

Chemicus (Morpeth).—If by "Oil of Santall" our correspondent intends *Oil of Sandal wood*, we know not that it is used in medicine.

W. W. (Glasgow).—(1.) We are not acquainted with the preparation called "Tinct. Saponis Viridis." (2.) The following answers most nearly to the preparation required: *Linimentum Ioduretum Gelatinosum.* Iodide of potassium ʒiv, proof-spirit ℥ij, dissolve. Dissolve also ʒvi of curd-soap in ℥ij proof-spirit, mix while still warm. (Foy.)

Inquirer (Glossop).—*Drop Black* consists of bone-black reduced to a very fine powder, and prepared as a pigment in the ordinary way.

W. B. K. wishes to know what is meant by "Gum of Life." Possibly *Guaiacum* is intended, as being obtained from *lignum vitæ.*

R. A. P. S. (Windsor).—(1.) Many Apprentices and others pass both the minor and major examinations, without previous study at Bloomsbury Square. A short time in the Laboratory, and attendance at the summer courses of lectures, would be found, however, very desirable. (2.) Read carefully Bentley's 'Manual of Botany,' from page 1 to 134, and from page 214 to 217, for your minor examination in Botany.

M. J. F. (Sheffield).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.* It may be obtained through any bookseller.

Tartar Emetic supplied by mistake for Cream of Tartar.—With reference to a paragraph under the above heading in our last number, Mr. Fisher wishes us to state that a wholesale druggist supplied him with the Tartar Emetic, *labelled Cream of Tartar;* hence the mistake.

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. IV.—No. XII.—JUNE 1st, 1863.

WEIGHTS AND MEASURES.

BILL BEFORE PARLIAMENT FOR THE INTRODUCTION OF A NEW SYSTEM.

About twelve months ago, at page 50 of the present volume of this Journal, we alluded to a report which had then been recently presented to Parliament by a committee, of which Mr. William Ewart and Mr. Cobden were active members, on the subject of Weights and Measures. The committee, after a full investigation of the regulations in different countries, as well as the requirements of our own country, came to the conclusion that great advantage would result from the adoption of one uniform system of weights and measures throughout all countries, and that the French metrical system was that best suited for general adoption. They recommended that measures should be taken for effecting the gradual introduction, under suitable regulations, of the metrical system into this country.

The Bill now before Parliament is designed to carry out the recommendation of the committee. It was brought under the notice of the Society at the anniversary meeting, and it was thought desirable that the entire Bill should be printed in this Journal, with the view of eliciting opinions from members throughout the country with reference to it.

A BILL FOR DECIMALIZING OUR EXISTING SYSTEM OF WEIGHTS AND MEASURES, AND FOR ESTABLISHING AN ACCORDANCE BETWEEN THEM AND THOSE OF FOREIGN COUNTRIES.

Whereas, for the promotion and extension of our internal as well as our foreign trade, it is expedient that the weights and measures of the United Kingdom should be decimalized and made to correspond with those of other countries: Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. From and after the expiration of *three* years after the *passing of this Act*, the unit of the measure of length or lineal extension shall in all cases consist of *thirty-nine inches and thirty-seven thousand and seventy-nine hundred thousandth parts of an inch* of the imperial standard measure, and shall be and is hereby denominated the new yard, or the "metre," wherefrom or whereby all other measures of extension whatsoever, whether the same be lineal, superficial, or solid, shall be derived, computed, and ascertained, and all measures of length shall be taken in multiples or decimal parts of the said new yard or "metre."

2. The unit of the measure of surface shall be the square of the new yard, except that the square of *one hundred* new yards shall be the unit of land measure, and shall

be and is hereby denominated the new aere or the "heetare," and all superficial and land measures shall be taken in multiples and decimal parts of the said units.

3. The unit of the measure of capacity, as well for liquids as for dry goods, shall be the cube of a tenth of the new yard, and the same shall be and is hereby denominated the new quart, or the "litre," and all measures of capacity shall be taken in multiples and decimal parts of the said new quart.

4. The unit of weight shall be the weight of a new quart of distilled water, and the same shall be and is hereby denominated the "kilogram," the half of which shall be the new pound, consisting of *one pound, one ounce, three drachms, and three hundred and twenty-six thousandth parts* of a drachm avoirdupois; and all measures of weight shall be taken in multiples and decimal parts of the said kilogram; the thousandth part of the same shall be called the "gram," which, with its decimal parts and multiples, shall be used for weighing bullion and precious stones, and for the purposes of pharmacy.

5. For the more convenient subdivision of weights and measures, it shall be lawful to use the double and the half of all the said units and their principal decimal divisions and multiples, as well as any other subordinate divisions which the Committee of the Privy Council for Trade may deem expedient.

6. The said weights and measures hereby established shall be and are hereby denominated the standard metric weights and measures.

7. Standards of the said new yard, or the "metre," the said new quart, or the "litre," and the said kilogram, and of the respective multiples and decimal parts, shall be made under the direction of the Committee of the Privy Council for Trade, and the same shall be duly verified by comparison with the standards in Paris, and copies and models of the same standards shall be sent to the Lord Mayors of London and Dublin, to the Lord Provost of Edinburgh, and to all counties, shires, stewartries, ridings, divisions, cities, towns, liberties, and places in which by law copies and models of the standard imperial weights and measures are or are required to be kept, and to such other places and persons as the President of the Committee of the Privy Council for Trade may from time to time direct.

8. All judges, magistrates, and other person or persons who now are or shall hereafter be authorized by law to order or provide copies of the present imperial standard weights and measures, shall at all times hereafter have like power and authority in every respect to order or provide copies of the standard metric weights and measures, and to charge the expenses thereof upon the fund or funds, money or moneys, that would have been liable in case it had been copies of imperial weights and measures that had been ordered or provided.

9. All and every the provisions and provision which are by law in force with respect to the inspection, verification, reverification, stamping, counterfeiting, and modes of conviction, with the penalty or penalties relating thereto, of the present imperial standard weights and measures, shall apply to and be in force with regard to the metric weights and measures in every respect as if the standard metric weights and measures were comprised in and designated by the imperial weights and measures in the Acts relating to such inspection, verification, reverification, stamping, counterfeiting, and modes of conviction, and the penalty or penalties relating thereto as aforesaid.

10. From and after the expiration of *three* years from the passing of this Act, the imperial and all local or customary weights and measures shall be abolished, and every person who shall sell by any denomination of weights and measures other than those of the metric weights and measures, or such multiples or parts thereof as are authorized by this Act, shall, on conviction, be liable to a penalty not exceeding the sum of *forty shillings* for every such sale.

11. From and after the expiration of *three* years after the passing of this Act, if any person or persons shall print, or if the clerk of any market or other person shall make any return, price list, price current, or any journal or any other paper containing price list or price current, in which the denomination of weights and measures quoted or referred to shall denote or imply a greater or less weight or measure than is denoted or implied by the same denomination of the metric weights and measures under and according to the provisions of this Act, such person or persons or clerk of the market shall forfeit and pay any sum not exceeding *ten shillings* for every

copy of every such return, price list, price current, journal, or other paper which he or they shall publish.

12. As soon as conveniently may be after the *passing of this Act*, accurate tables shall be prepared and published under the authority of the Committee of the Privy Council for Trade, showing the proportions between the imperial weights and measures heretofore in use and the metric weights and measures hereby established, with such other conversions of weights and measures as the said Committee of the Privy Council for Trade may deem necessary, and after the publication of such tables all future payments to be made shall be regulated according to such tables.

13. And whereas the weights and measures by which the rates and duties of the customs and excise, and other Her Majesty's revenue, have been heretofore collected, are different from the metric weights and measures directed by this Act to be used: It is hereby enacted, that so soon as conveniently may be after the *passing of this Act*, accurate tables shall be prepared and published under the direction of the said Committee of the Privy Council for Trade, in order that the several rates and duties of customs and excise and other Her Majesty's revenue may be adjusted and made payable according to the respective quantities of the legal standards directed by this Act to be used, and that on the expiration of *three* years after the passing of this Act the several rates and duties thereafter to be collected by any of the officers of Her Majesty's customs or excise, or other Her Majesty's revenue, shall be collected and taken according to the calculations in the tables to be prepared as aforesaid.

14. From and after the expiration of *three* months after the passing of this Act, and until the use of the metric weights and measures shall be made compulsory, the said metric weights and measures shall be deemed and taken to be legal weights and measures, and as such may be used for all purposes whatsoever.

It will be observed that, should this Bill pass, in three months afterwards the system of metric weights and measures, which the Bill describes and is intended to introduce, *may be* legally used in any transactions; and in three years after the passing of the Bill, *it will be illegal* to use any other than these metric weights and measures.

It is proposed, then, that in 1866 all measures of length, of surface, of capacity, and of weight, that are now legalized or used in this country, excepting those of the French metrical system, shall be abolished, the new system being substituted for them, and penalties being attached to the use of the old systems in commercial transactions.

It cannot be denied that this proposition involves very important consequences, and that the measure demands the most serious consideration.

In order to assist those who take an interest in the subject in endeavouring to realize some of the consequences of the proposed change, we will point out how it will affect the values of those denominations of measure which it is proposed to transfer, nominally, from the present to the intended new system.

Measures of Length.—The French "metre" is to be taken as the unit of the measures of length, and as this differs only by about three inches from our present yard, it is to be called the "new yard," or "metre." It will be equal to 39·37079 inches of our present measure. All other measures of length will be either multiples or submultiples by ten of this new yard. There will be no foot and no inch, because no submultiple of the metre by ten will come sufficiently near to those measures, as they at present exist, to justify the retention of the names. In the French system, the multiples of the metre are distinguished by Greek prefixes, *deca*-metre, *hecto*-metre, *kilo*-metre, etc., and the submultiples by Latin prefixes, *deci*-metre, *centi*-metre, etc. It is not stated in the Bill what other, or whether any other, English names are to be used for designating measures of length or extension besides the yard; but we believe there is to be a "new mile" as well as a new yard, and that this will be the third multiple by ten from the metre, that is, 1000

metres, or 1093·63 of our present yard, or 0·6214 of our present mile. The new mile therefore will be about two-thirds of the present mile.

Measures of Surface.—The principal point to be noticed in connection with these measures is, that the square of the new yard or metre being taken as the unit from which the other measures are to be calculated, the square of 100 new yards, or 10,000 square metres, will, according to the Bill, constitute the "new acre," or "hectare." Now this will be equal to 2·474 acres of our present measure. We should think this must be a mistake, for as the Bill proposes to legalize the use of the half of any of the decimal quantities, and in accordance with this makes the new pound equal to half a kilogram, it would surely be better to make the "new acre" equal to half a hectare, or 1·237 of our present acre.

It happens unfortunately that the application of the proposed new measures of length and of surface would in their practical results appear a little opposed to the general tendency of the present age. The effects of measuring by the new mile and the new acre would be to increase the nominal distances between different localities, and to diminish the nominal possessions of the owners of land.

Measures of Capacity.—The French litre is to be the unit of these measures, to be called the "new quart." This will be equal to 1·76 pint of our present measure, and the half of this will no doubt be a "new pint," or rather we should say the "new new pint." The gallon will be abolished, and also, we presume, the fluid ounce.

Measures of Weight.—The weight of a new quart of distilled water being the unit of weight under the name of kilogram, the half of this will be the new pound, equal to 1·102 pound avoirdupois. The Bill gives no information as to the other denominations of weight, excepting that the one thousandth part of the kilogram will, as abroad, be called the "gram," and we presume there will be no grain; indeed, the words gram and grain are so nearly alike in writing, that the use of both would lead to confusion.

Such are the general features of the measure as it is proposed to be enacted at the present time. Minute details are avoided in this Bill, as it is considered, no doubt, that these can be arranged and supplied during the three years that the new system is to be permissive—not compulsory. It may indeed be doubted whether it would be possible, in so short a time as three years, to effect a change of so radical a nature as this, and one affecting every part of the community in transactions which are of daily occurrence. In France, where the system originated, it took a much longer time to reconcile the people generally to the use of the metrical system; but then it may be said that we have now the benefit of the experience of the French, who have used this system, to a greater or less extent, for more than fifty years, and of scientific and practical men in other countries, who generally agree in commending it as the best, most complete, consistent, and simple, most easily understood, acquired, and applied of all the systems hitherto devised or constructed. This indeed is the only system we have that has any claims to simplicity, consistency, and completeness. It has not, like its competitors, grown up, been added to, altered, and amended, as the extension of knowledge and the higher cultivation of the arts and sciences have called for the application of better-defined and more accurate standards of admeasurement. The metrical system was brought forth in its complete form, the offspring of a Commission appointed by the French Academy of Sciences in the latter part of the last century, and of which the celebrated Laplace was a member. There were two propositions for the establishment of a fundamental unit from which all the calculations should start, and which should constitute an unchangeable natural phenomenon, to be referred to at any time, if necessary. These were, first, the length of a pendulum vibrating in seconds of time at a certain latitude; and se-

condly, the measurement of the circumference of the earth. The latter of these was adopted by the Commission, who were anxious to make the system applicable for international purposes. Two eminent astronomers were appointed to make a new measurement of an arc of the meridian, and the ten millionth part of a quarter of the earth's circumference was made the unit of the measure of length, to be called the "metre" (from *μέτρον*, measure).

The metre thus established forms the fundamental unit or basis of calculations for all the measures of length, of surface, of capacity, and of weight, in this, which is called the *metrical system*.

Starting from the metre, which is equal to 39·37079 inches of our measure, and which is now proposed to be our new yard, all the divisions and extensions of this measure are multiples or submultiples by ten, and this principle extends through all the other parts of the system, so that it is also a *decimal system*, which greatly facilitates calculations. The square of the metre gives the unit for measures of surface. The cube of a tenth of the metre (cubic decimetre) is the unit of measures of capacity, and is called the "litre." Lastly, the weight of a cubic centimetre of distilled water at its point of greatest density is the unit of measures of weight, and is called the "gram." There is thus a simple and definite relationship maintained between all the denominations of weight and measure in this system.

It will be seen by a notice elsewhere that a meeting of the members of the Society will be held at 17, Bloomsbury Square, on the 10th of June, for the purpose of considering the propriety of petitioning Parliament on the subject of this Bill.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *6th May*, 1863,

Present—Messrs. Bird, Bottle, Bucklee, Davenport, Deane, George Edwards, J. B. Edwards, Hanbury, Haselden, Herring, Hills, Meggeson, Sandford, Savage, Squire, and Waugh,—the following were elected

MEMBERS.

BUCKINGHAM .....Sirett, George Beynon.
CONGLETON .....Hartley, William.
FOREST HILL .....Furze, Henry.
LONDON .....Starkie, Richard Stringer.
NORWICH .....Knights, John Atmore.

BENEVOLENT FUND.

The following sums were announced as having been received in April, amounting to £42. 8*s*.

DONATION.

WAUGH, GEORGE, 177, Regent Street ....£25.

SUBSCRIPTIONS.

Ainslie, William, Edinburgh ...	£0	5	0	Carmichael, Lauchlan, Edinburgh	£0	5	0
Aitken, William, Edinburgh ...	0	5	0	Cooper, George, Exeter	0	5	0
Bishop, Alfred, 17, Speck's Fields	2	2	0	Cupiss, Fras., Diss	0	10	6
Bishop, Thomas, Woolwich ...	0	10	6	Edwards, William, Hastings ...	0	5	0
Blanshard George, Edinburgh	1	1	0	Fenn, John T., 83, Regent St., Westminster...	0	5	0
Bond, John, Yarmouth	0	5	0	Fletcher, Fras., Cheltenham ...	0	5	0
Bolton, Thomas, Tenterden ...	0	5	0	Gardner, James, Edinburgh ...	0	5	0
Boyce, John, Chertsey.....	0	5	0	Glass, John T., Cheltenham ...	0	5	0
Brailey, Chas., Heavitree	0	5	0				
Butcher, Thos., Cheltenham ...	0	5	0				

Harvey and Reynolds, Leeds...	£1	1	0	Prior, George T., Oxford	£0	10	0
Hustwick, Thos. H., Hereford	0	5	0	Pratt, John, Chichester	0	10	6
Holman and Ham, Exeter	0	10	0	Roberts, Albinus, St. Alban's...	1	0	0
Hurst, Wm. J. H., Gloucester	0	5	0	Smith, Nathl., Cheltenham.....	0	5	0
Husband, Matthew, Exeter ...	0	5	0	Stathers, Wm., 43, Norland Road	0	10	6
Jackson, Thomas, Manchester	0	10	6	Stone, John, Exeter.....	0	5	0
Manifold, John J., Weaverham	0	10	0	Street, Edward, Cheltenham ...	0	5	0
Nind, George, Wandsworth ...	0	10	6	Tanner, Wm. Nicholas, Exeter	0	5	0
Palk, John, Exeter	0	5	0	Tucker, Charles, Bridport	0	10	6
Palmer, Faithful, Cheltenham	0	5	0	Young, George, Millwall.....	0	5	0
Powell, John, Shaftesbury	0	10	6	Waite, Joseph, Cheltenham ...	0	5	0

SPECIAL MEETING OF THE COUNCIL, 13*th May*,

To consider a Bill now before the House of Commons, entitled "A Bill to prohibit the Sale and Use of Poisoned Grain in certain cases."*

Present—Messrs. Bird, Hanbury, Haselden, Herring, Hills, Meggeson, Sandford, Squire, and Waugh.

Resolved—"That the following Petition be presented."

TO THE HONOURABLE THE COMMONS OF GREAT BRITAIN AND IRELAND IN PARLIAMENT ASSEMBLED.

The Petition of the Council of the Pharmaceutical Society of Great Britain humbly showeth:—

That your Petitioners have seen with surprise and alarm a Bill now before your Honourable House, entitled "A Bill to prohibit the Sale and Use of Poisoned Grain in certain cases."

That the provisions of this Bill extend far beyond the objects and purposes expressed in its title, and would materially interfere with your Petitioners and others, in the ordinary exercise of their business, and inconvenience the Public generally.

That the Bill prohibits not only the sale of Poisoned Grain, but of "any Poison or Poisonous Ingredient," "to be used for the purpose of injuring or destroying any Birds or Animals."

That this Bill is probably intended to prevent the destruction of small Birds, but your Petitioners humbly submit that in effect it will go much further, and render it penal to sell or use any Poison for the destruction of Rats, Mice, or other Vermin, or of any Cat, Dog, or other Domestic Animal, which it may be desirable to destroy speedily and easily: That it will also render the advantageous and now almost universally adopted process of dressing seed-wheat (prior to sowing) with poisonous salts for the prevention of smut, at all times liable to penal misconstruction.

Wherefore your Petitioners humbly pray that your Honourable House will so modify the said Bill as to prevent the injury and inconvenience they have hereby endeavoured to set forth.

And your Petitioners, as in duty bound, will ever pray.

MEETING OF COUNCIL, *May* 20*th*, 1863.

Present—Messrs. Bird, Bottle, Deane, George Edwards, John B. Edwards, Evans, Hanbury, Haselden, Hills, Mackay, Meggeson, Savage, Squire, Standring, Waugh.

CONVERSAZIONE.

The usual annual Conversazione was held in the Society's rooms on Tuesday evening, the 19th of May, and a large number of visitors, together with members and associates of the Society, met on the occasion.

The following objects, for which the Council were indebted to the gentlemen who kindly contributed them for the evening, were distributed through

* See p. 568.

the rooms:—Several valuable pictures and engravings from Messrs. Vokins, Mr. Hills, and Mr. Bird; some handsome busts, statues, and statuettes from Mr. Copeland, Mr. T. Butler, and Mr. Brucciani; bronzes from Messrs. Jackson and Graham; specimens of Majolica ware from Mr. Phillips; and two cases of stuffed birds from Mr. Leadbeater.

Some Japanese articles from Messrs. Farmer and Rogers; a collection of corals, enamels, etc. from Messrs. Phillips Brothers; specimens of Indian art from the Royal Asiatic Society; and some wood-carvings and objects, illustrating recent discoveries at Jerusalem, from Miss Rogers.

Some curious pictures from Mr. Cabrera; photographs from Professor Busk and Mr. Palmer; articles of vertu from Captain Shea; and designs for artistic paperhangings, etc. from Messrs. Green and King; a large collection of articles in aluminium and aluminium bronze from Messrs. Mappin Brothers; a specimen of wood perforated by the teredo from Mr. Hills; and maps of the occurrence of fogs, and diagrams of sound-trumpets from Dr. Gladstone. Señor Gallejos showed his ingenious artificial arm and hand, and exhibited its capabilities; and Mr. King exhibited some aquaria and fish-spawn.

There was a large number of medical and other plants from the Royal Botanic Society's garden; a specimen of the living plant of the Calabar Ordeal Bean from Mr. Daniel Hanbury; manna products from Mr. M. C. Cooke; specimens illustrating the production of opium from the Indian Museum; and a specimen of anchusine and leech cocoons from Mr. Allchin. Also specimens of New Zealand sarsaparilla, flax, etc. from Mr. Keating; various silk cocoons, cloth from the inner bark of trees, and other illustrations of vegetable structure from Mr. P. L. Simmonds; a fine collection of the silk-producing moths of India from Mr. Moore; and some preserved ferns and seaweeds from Mr. Jardine.

A bar of thallium, weighing half a pound, was contributed by Mr. Crookes; specimens of sulphur by Mr. Hills, of Deptford; and a case of specimens of the rare metals, etc., including metallic chromium, manganese, molybdenum, and lithium, as well as the three allotropic varieties of boron and silicon, by Mr. T. B. Redwood; salts of platinum, etc. by Messrs. Johnson and Matthey; improved poison-bottles by Mr. Toogood; and chemicals by Messrs. Johnson and Sons; a good collection of minerals by Mr. B. M. Wright, and another by Mr. Gregory; a specimen of the turtle stone by Mr. Tennant; flint and flint-implements by Mr. Squire; and a case of minerals and woods by Mr. Baldock, who also exhibited a microscope. George IV.'s medicine chest by Mr. Bourdas; chemical apparatus in stoneware by Messrs. Cliff and Son; a gas-regulator by Mr. Duckham; models of crystals by Mr. Larkin; some spirit lamps, etc. by Mr. Mills; and specimens of Parhydor, or impermeable silk, by Messrs. Maw and Son.

Aneroid barometers by Messrs. Spencer, Browning, and Co.; an improved barometer by Mr. Symons; telescopes and a telescope stand by Messrs. Horne and Thornthwaite (who also exhibited the crystallization of thallium); some improved thermometers by Mr. Casella; and some articles in vulcanite by Mr. Silver.

There was a magneto-electric machine from Mr. A. Davis (Sheffield); an improved ventilating apparatus from Mr. M'Kinnell; a powerful air-pump, etc. from Mr. Griffin; and a blowpipe chest, electrotypes, etc. from Mr. How. There was also a good show of microscopes from Messrs. Ross, Murray and Heath, How, Horne and Thornthwaite, Powell and Lealand, and Ladd, who also exhibited the spectrum of thallium. In one of the rooms Mr. Atkinson showed experiments with his large induction coil, and in another Mr. Charles Jones exhibited his photographic dissolving views.

A working model of the pneumatic dispatch from the Polytechnic Institution was shown in the laboratories; and Carey Lea's constant aspirator,

recently described in the 'Chemical News,' was exhibited in operation by Mr. T. B. Redwood. This consists merely of a tube (which may be of zinc or tin) about 2 feet long and $\frac{4}{10}$ inch internal diameter, with a branch of the same material $\frac{3}{10}$ inch in diameter and 4 inches long, inserted horizontally at a distance of 4 inches from the upper end. When required for use it is supported in any convenient manner over a sink; an india-rubber tube, communicating with the tap of a water-cistern being attached to the horizontal branch, and the upper end of the long tube being made to communicate with the vessel through which it is desired to pass a current of air.

On turning the tap, a current of water is established through the horizontal branch and down the long tube, which (acting as a sort of piston) draws air in at the upper end of the tube, or through whatever apparatus it may be connected with; the air subsequently escaping with the water at the lower end of the long tube.

The whole apparatus may be easily made by the operator himself. A stout cork is bored parallel to its axis, and rather on one side of the centre, and then a smaller hole is made at right angles to the first, communicating with it, but not passing further. Three pieces of tube (which may be of glass) are then fitted into the cork, not allowing either to extend as far in as the junction. The cork is then brushed over with a solution of sealing-wax in alcohol.

TWENTY-SECOND ANNIVERSARY OF THE PHARMACEUTICAL SOCIETY.

Wednesday, May 20th, 1863.

MR. PETER SQUIRE, PRESIDENT, IN THE CHAIR.

The PRESIDENT opened the Meeting with the following Address:—

Gentlemen,—We are met together to-day to celebrate our Twenty-Second Anniversary, and those amongst us who remember the very commencement of the Society must rejoice at its present position and prospects. They will recollect under what difficult circumstances our association at length took place; mere proximity, though generally sufficient for the manifestation of chemical affinity, in our case did not suffice, we had to be pressed together with considerable force before we would combine. However, by the perseverance and self-abnegation of a few spirited and far-seeing individuals, the Society was formed, and the names of those whose memory we reverence will long live in our annals. By the indefatigable labours of succeeding Councils, the several parts of our system have been built up, till at length the whole fabric has been brought to such a state of completion as to serve all the purposes originally contemplated by the founders, whilst it affords satisfaction to the Government and the War Office, and has furnished to the public a large number of well-qualified men for the duty of dispensing of medicines. The fact that Pharmaceutical Chemists are being released from the duty of serving on juries will induce the rising generation whose minds are directed to study pharmacy to qualify themselves for the title, and the result will be that the boon granted to the pharmaceutical chemist will prove of immense benefit to the public at large. The master will not be content to allow the apprentice to get through his term with carelessness, but will see the necessity of directing his pupil how to acquire the knowledge the parent has paid for; and thus every apprentice will, at the close of his apprenticeship, be ready to undergo the minor examination, and a short period in the laboratory of this institution would then qualify him for the major. It is quite true that many young men have passed both the examinations with great credit to themselves, without having availed themselves of the advantage this institution offers; still

I think it is a great saving of time to study systematically under well-qualified teachers; and when we find, as here, a laboratory unequalled for all the appliances of study and research, so well ventilated that the health of the pupils does not in the least suffer from offensive and corrosive gases given off during the several processes carried on; a library, containing the best works on pharmaceutical literature, and the most important periodicals of the day, in English, French, and German; a museum equal, if not superior, to any other of the kind; lectures by eminent professors on Chemistry, Pharmacy, Materia Medica, and Botany; and lastly, incentives to study, in the shape of prizes, medals, and scholarships, it must be obvious that a more complete and inexpensive system of education could not be provided for those who aim at occupying a good position in a responsible profession. I shall not detain you with entering upon other matters which are contained in our Report, but being your representative at the Committee for preparing the British Pharmacopœia, you will expect me to say something of the long-expected work. I am glad to say that the body of the work is now in type, and, in all probability, the publication will take place at the end of the year. You will recollect that two special meetings were held in these rooms in the summer of 1859, to express an opinion adverse to the new grain, and advocating the continuance of the old grain as well as the old apothecaries' weights. Dr. Wilson, the proposer of the new grain, was present at the second meeting, but failed to alter the resolution come to at the first meeting; notwithstanding this, however, the Pharmacopœia Committee resolved to adopt the avoirdupois system and the new grain. The medical men, however, as a body, disapproved of the new grain, and the Medical Council met and abolished it; they resolved to retain the troy grain, to introduce the avoirdupois pound and ounce and to abolish all intermediate weights of either system, leaving the profession and the chemists to manage as they best can with these three weights. I must here remark that the decimal metrical system is by no means unpopular with the Pharmacopœia Committee, The London section proposed that by the side of all weights should stand the equivalent in metric weights. The Edinburgh Pharmacopœia sub-committee, in giving their opinion to the Medical Council as to the proper weights to be used in the British Pharmacopœia, concluded by saying that they "will hail with pleasure the occasion, when men of science will persuade trade, commerce, and Government, that a decimal system of weights and measures is the most truly scientific of all, as well as the most facile in practice. So far as pharmacy and medical practice are concerned, men of science will meet with no opposition to a really scientific system such as that; and no new obstacle will be created by the system which has been adopted in the meantime for pharmacy by the Pharmacopœia Committee and the General Medical Council, *as the only eligible mode of reconciling real existing discrepancies, and getting rid of actual serious inconvenience.*" The Dublin sub-committee stated that they fully agreed in opinion with the Edinburgh sub-committee. The conference of the three Committees also decided "that a table of Weights and Measures, with their equivalents in the metric system, be inserted in the introduction to the Pharmacopœia." I have said thus much to show the feeling of the Committee upon the subject of Weights and Measures, because there is now before Parliament a Bill to decimalize our existing weights and measures, and make them conformable to the metric weights for pharmacy, etc., and I think our Body ought to take action at once upon it. Looking over the Balloting List, I miss three old and much-respected members of Council. Mr. Thomas Herring, although an octogenarian, is still as anxious as any of us for the welfare of the Society, and I hope he may yet live to join our Council again. Mr. Herring has done good service for pharmacy in his time; I remember the introduction of genuine powdered drugs by him now nearly fifty years since; the brilliant colours and the aroma of these captivated every druggist who saw

them; Mr. Herring was also a useful member of the Pharmacopœia Committee appointed by this Council. Mr. Lescher has been an assiduous and highly useful member on the several Committees for the carrying on the business of the Society, and those Committees will miss his services very much. Mr. Bottle, I see, is here to answer for himself, but I must say of him that although a distant country member, he has never shirked his work. And now, Gentlemen, allow me to resign my post of honour, which I have held by your indulgence for three years altogether; and in doing so, I must tender my best thanks to the Council for their hearty co-operation and very kind assistance in carrying out the important business of the Society; it requires much sacrifice of time on their part, in attending to the duties of the Council Board and the various Committees, and we have had some important matters before us during the past year. This brings me to notice the untiring zeal of your Secretary, for which he has the good wishes and good words of all the Council, and I am sure will receive the same from the Society at large; it is to his activity, and that of the members of the Council, that we are indebted for the boon obtained in the Juries Bill.

The Secretary then read the

REPORT OF THE COUNCIL.

FINANCIAL STATEMENT—*From 1st January, to 31st December*, 1862.

Receipts.	£.	s.	d.
Balance in Treasurer's hands	157	11	7
,, ,, Secretary's hands	2	11	11
Life Members' Fund:			
30 Life Members' fees 215 5 0			
Interest 57 14 4			
	272	19	4
Benevolent Fund:			
Subscriptions 45 8 0			
Interest 160 19 0			
	206	7	0
Government Securities:			
Interest	28	17	6
Rent	83	10	0
Fees:			
Lecture	105	10	6
Laboratory	313	6	0
Registrar—			
30 Pharmaceutical Chemists 162 15 0			
34 Assistants 138 12 0			
68 Apprentices 142 16 0			
399 Registration Certificates 19 19 0			
	464	2	0
Subscriptions:			
345 London Members 362 5 0			
1464 Country Members 1537 4 0			
89 Associates 46 14 6			
44 Apprentices 23 2 0			
	1969	5	6
Arrears of Subscription	81	7	6
	£3684	18	10

Expenditure.	£.	s.	d.
Benevolent Fund:			
Relief granted 40 0 0			
Investment 279 15 4			
	319	15	4
Life Members' Fund: Investment	330	15	0
Conversazione	61	16	2
Pharmaceutical Meetings	4	17	5
Sundries	5	15	8
Repayments of Subscriptions in excess	3	13	6
House Expenses	27	1	3½
Rent, Rates, Taxes, and Insurance	444	7	8
Alterations and Repairs	47	19	4
Fixtures and Fittings	72	6	4
Apparatus	58	1	8
Library (including £61, New Cases)	109	8	6
Museum	22	7	6
Furniture	18	16	1
Stationery	8	11	10
Postage	57	5	3
Printing and Engraving	65	16	6
Advertisements	33	12	4
Journals, Postage of, etc.	173	13	4
Carriage	2	17	7
Collector's Commission	25	2	3
Travelling Expenses	126	13	0
Salary to Secretary	250	0	0
Wages	159	2	6
Expenses of Society in Scotland	64	14	4
Board of Examiners	58	16	0
Professor of Chemistry and Pharmacy, including duties as Curator, and payment of Assistant	300	0	0
Professor of Botany and Materia Medica, including duties as Curator, and payment of Assistant	250	0	0
Special Evening Lectures	21	0	0
Subscription to Royal Botanic Gardens	21	0	0
Prize Medals, etc.	4	16	6
Laboratory:			
Director's Salary 50 0 0			
Demonstrator 25 0 0			
Porter's Wages 11 14 0			
Expenditure (materials) 67 15 10½			
	154	9	10½
Law Costs	94	4	8
Balance in Secretary's hands	2	4	9
Balance in Treasurer's hands	283	16	8
	£3684	18	10

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement, and that, as shown by the Books of the Society, there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1862 :—

On account of the General Fund, New 3 per Cents....	£1000	0	0
Benevolent Fund, 3 per Cent. Consols	5875	8	7
Life Members' Fund, 3 per Cent. Consols	2355	2	5

EDWARD CONSTANCE,
WILLIAM M'CULLOCH,
JOSEPH THOMAS PRESTON,
JOHN CARR,
} *Auditors.*

26th February, 1863.

It is gratifying to observe by the statement just read that a considerable reduction in the expenditure of the Society has been effected in the publication of the Journal; a much greater reduction indeed than the Council had reason to anticipate when they announced in their Report of last year that new arrangements had been entered into regarding it. The entire cost of this publication, including its delivery to every Member, Associate, and Registered Apprentice of the Society, which in 1861 amounted to £608. 12*s*. 3½*d*., was in 1862 only £173. 13*s*. 4*d*., a sum barely exceeding the expense of transmission by post. A new item will be observed on account of the Laboratory, which, after a lapse of ten years, is again in the hands of the Council; but as the change only occurred in October last, the receipts and expenditure will neither of them afford sufficient data on which to form a fair estimate of the future.

So far as relates to receipts and expenditure, the Report annually presented to the Society in May stops short at the preceding Christmas; in all other matters it has reference to what may be called the "Council year," extending from one election to another.

Great care has been taken to make the Laboratory a thoroughly practical School of Pharmacy. It will be remembered that much disappointment was expressed by the Council at the smallness of the number of pupils who availed themselves of its advantages after so much money had been expended in rendering it perfect. In its construction, the Laboratory of this Society is unequalled; and when, at the close of the Session of 1861–62, Professor Redwood resigned his charge, the Council took active measures to find a successor by whom its capabilities would be fully developed. Many candidates presented themselves for the appointment, and among them were men of such established reputation in the department of Chemical Science, that it was difficult to select, or rather reject. It was however gratifying to the Council to be able, in the best interests of the Society, to choose both a Director and Demonstrator who had been trained in its own school; and in placing Dr. Attfield at the head of the Laboratory, with Mr. Stanford to assist him, they felt assured of ultimate success. The latter gentleman has lately vacated his office to take charge of a commercial enterprise, to which his own scientific researches gave rise; and the Council, while regretting the loss of his services, cannot but express a high sense of his merit, and an earnest wish for his future prosperity. There has been an increase in the number of pupils in the present session, and from the numerous applications lately made for information regarding the school, it may be fairly expected that the next will open with a much larger class. The Council have deemed it advisable to lessen the fees charged for short terms, and think it would be desirable also to reduce the payment for the whole session as an inducement for students to enter for the entire term.

The attendance on the Morning Lectures, given by the Professors, has continued to improve, as may be seen by the fees received.

The Council have great pleasure in reporting the progress of the two "Jacob Bell Memorial" Scholars in the Session of 1861–62, which has at once justified the award and proved the value of such a stimulus to extra study on the part of young men. When this endowment is more generally known to Pharmaceutical Students, there can be no doubt that extensive competition will arise, and candidates will enter the lists for the higher or "Senior Scholarship."

The new arrangements for the appointment of Local Secretaries are now in operation, and the Council hope at the end of this meeting to find that the Country Members have availed themselves of the opportunity of assisting in these elections. There are many ways in which the interests of the Society may be advanced by these secretaries; they should annually furnish the Overseers in their respective localities with an authentic list of Registered Pharmaceutical Chemists who are exempt from serving on juries; to their energy and faithfulness the Council look for the diffusion of information among the apprentices in country districts as to the working of the Society, to guide them in their preparation for the minor examination. The Council wish it to be understood that wherever suitable opportunities are given by employers, and a fair amount of industry maintained by apprentices, there should be no difficulty in passing the minor examination immediately upon the expiration of the term of apprenticeship; and it would greatly advance the progress of pharmacy, if the Members throughout the country would recognize this examination as indispensable in the engagement of competent salaried assistants. In the distribution of the Benevolent Fund, too, the Council always require positive information as to the condition of the applicant, the relief needed, and the way in which it can be most advantageously applied. Such particulars come best from the Local Secretary. He may even be the channel of application in the first instance; and the Council hope also, that while he has the pleasure and privilege of dispensing the funds of this important branch of the Institution, he will, on the other hand, lose no opportunity of increasing them by inducing his brethren to add subscriptions to the Benevolent Fund.

The Council cannot omit this opportunity of urging the claims of the Benevolent Fund. The sum granted in relief in 1862 was £40. An applicant qualified to receive, and really in a condition to need assistance, has never asked in vain. Still, much more might be done. The Royal Medical Benevolent Association is active in providing for widows and orphans, and the Pharmaceutical Society has surely cases of similar need within its province. Attention was drawn in the Report of last year to the rules laid down in 1848 regarding this fund. The system of granting pensions has never yet been carried out, as the capital invested does not amount to the sum which the framers of those rules thought necessary for that purpose—£10,000 was the proposed standard; it now exceeds £6000, and if an effort cannot be made to reach the larger amount, it may be well to consider the desirability of commencing such grants as far as the present means permit. Although the subscriptions received in 1862 were small, the Members may have observed by the Transactions, or if not, will now be gratified to learn, that the present year has brought a considerable increase, and, in addition, some munificent donations.

The steps taken in 1862 to illustrate the condition of British Pharmacy in the International Exhibition, proved eminently successful, and a Prize Medal was awarded to the Society. That medal was given for the excellence of the collection of drugs and preparations used in medicine *as a whole*, not for any individual specimens, and the Council consider that thanks are due to those gentlemen who freely contributed for the honour of the Society rather than themselves.

The Case in which the collection was displayed at the Exhibition has been since purchased for the use of the Library, and forms there a very handsome and necessary addition to the room.

The Museum has been enriched from the same source, but without expense to the Society. Many gentlemen who had sent specimens for the collection, placed them at the disposal of the Council. The Indian, Turkish, and Manilla contributions were also very liberally presented, and will form valuable additions.

The Council are glad to observe the increase in the number of provincial associations which, being formed on the basis of education, substantially promote the objects of this Society; the Council heartily wish such associations permanence and success.

The subject of methylated spirit has occupied much of the attention of the Council during the year, and its consideration has been rendered extremely difficult by the position taken in the matter by the Government. So far as the use of this spirit in its *proper* and *legitimate* form is concerned, there may perhaps be little to fear, its offensive flavour will prevent it from extending far into pharmacy; but when means are used to free the spirit from the methyl (a proceeding decidedly illegal), a very serious injury is done to the fair trader, who is thus, as it were, brought into competition with the *illicit still.* The Council have endeavoured to fulfil their duty to theMembers by laying these facts before the proper authorities.

A Bill has been introduced into Parliament, entitled "*A Bill to prohibit the sale and use of Poisoned Grain in certain cases,*" the provisions of which extend far beyond its title; rendering it penal to sell, buy, or use any poison, poisonous ingredient, or poisoned grain, with intent to injure or destroy any birds or animals. On finding this, the Council at once took steps to amend or prevent the passing of an Act so important to those who are frequently called upon to supply poison for the destruction of vermin and domestic animals which it may be necessary to kill; as well as for the preparation of seed corn. An interview was obtained with the promoters of the Bill; they admitted its imperfections, and withdrew it when brought up for second reading, presenting however at the same time an *Amended Bill,* the provisions of which are not yet published; it stands for second reading on the 17th of June. A Petition has been laid on the table of the House of Commons, and the Council must not lose sight of the matter. Every member of the Society would do well to bring this question under the notice of his representative in Parliament. The alleged necessity for legislation is to prevent the wholesale destruction of small birds; but there can be no occasion, in doing this, also to throw a parliamentary shield over rats, mice, blackbeetles, and bugs.

Pharmaceutical Chemists have, during the past year, received further recognition by the Legislature; a great and important privilege was granted to them in the exemption from service on juries, which will be appreciated by every man who has been compelled for such service to leave a business for days in succession, which requires his personal supervision no less for the public good than his own. To obtain this required no small exertion on the part of the Council, backed as they were by their indefatigable Secretary in the work: great credit is due to him in this matter. With all efforts, however, this object would never have been attained but for the existing means of defining Pharmaceutical Chemists, by a complete and legal system of registration, and for that spirit of union and co-operation which is the true vitality and strength of all such associations.

Already there is abundant evidence of the good which will accrue from this exemption; it has strengthened the position and augmented the numbers of the Society, as will be better shown in the financial report of the current

year; it has created a greater interest, not only amongst Members, but also in those who see in it an inducement to become Members; and the Council, in now resigning their trust once more to those who gave it, feel confidence that their labours of the year have not been in vain.

Mr. JONES, of Leamington, in proposing a resolution for the adoption of the Report, said the statement it contained was so full and complete, and at the same time so satisfactory, that it was unnecessary for him to trouble the meeting with any lengthened remarks. It must be gratifying to the Members to find that a considerable reduction has been made during the past year in connection with the Journal. It had been long felt that it was a heavy charge on the resources of the Society, but the advantages resulting from it had, no doubt, been commensurate with the large outlay it annually involved. It had conferred great benefit on country members by the information it conveyed, and all would rejoice to find that the Council had been able so materially to diminish its cost, without detracting in the least from its merits. The report, with reference to the laboratory, was also satisfactory; and those who had sons whom they intended to bring up to the business would be gratified to know there were such resources at their command, and means for obtaining all the information required for their qualification, by attending the lectures and the laboratory. In the present day it was necessary for a pharmaceutical chemist to possess a knowledge of many subjects —to be, in fact, a sort of walking encyclopædia. There were now so many sources of information to all classes, that unless pharmaceutical students took advantage of the opportunities offered them, they would find themselves outstripped by others, and left behind in the race. As a country member, he congratulated the Society on the means adopted for the appointment of local secretaries. This was a means of beneficially extending the influence and operations of the Society, by bringing the country members more freely into communication with the Council on matters of importance and interest to the trade. He concurred with the remarks in the report respecting the collection of drugs exhibited last year at the International Exhibition, and thought they were much indebted to the gentlemen who supplied the specimens. There had, probably, never been a time when such good drugs and chemicals could be obtained as now, and he thought some credit was due to the Pharmaceutical Society for the improvement that had taken place in this respect of late years. The advantage of their association had also been shown by the success which had attended their application for relief from serving on juries, and the opposition they had offered to the Bill relating to the sale of poisoned grain. The bold front they were able to present when necessary materially advanced their position, and obtained for them that recognition and deference to which, as a body, they were justly entitled. In conclusion, he moved:—That the Report now read be received and adopted, and printed in the Transactions of the Society.

Mr. URWICK seconded the motion, and congratulated the Council on the satisfactory statements given in the report. He thought the Council had done right in taking the laboratory into their own hands, and he had no doubt the measures adopted would have the effect of increasing the number of pupils, to the benefit of the Society.

Mr. KENT said, it afforded him pleasure, as, no doubt, it would the Members generally, to find that the number of pupils was increasing. He hoped they would continue to reduce the fees, and adopt every means in their power to draw youths to them, for that instruction which the Society was now so well provided with the means of affording. These young men were the life of the Society, as customers were to their shops, and everything should be done to induce them to join the Society. He believed the expense of attending the course of instruction provided by the Society had prevented many from availing themselves of it. The cheaper, therefore, they could render the instruction, the better would it be for the Society, because it would add to their numbers, and gain for the institution the gratitude of those who had benefited from what they learnt there. He did not think they had ever had a more encouraging report laid before them than the one just read. There was nothing in it to distress them—no heavy charges for law proceedings, as on some former occasions. He little thought when he went round, some twenty-two or twenty-three years ago, to solicit

signatures from the wholesale and retail chemists and druggists, for the purpose of calling a meeting at the Crown and Anchor Tavern to protest against Mr. Hawes's bill, that it would result in the establishment of such a Society as this. The suggestion came from Mr. Farmer, who, like himself, was not one of the great chemists either of the East or the West, yet they could see that the interests of all were identified in the questions then raised. The success of the movement was matter for congratulation, and he felt great pleasure and happiness at having lived to witness the proceedings of that day.

Mr. Collins thought the gentlemen who had preceded him must have read the Report through rose-coloured spectacles,—everything with them was *couleur de rose*,—but he was inclined to think the report was not so full of satisfaction as those gentlemen would have them believe. There were many items in it which afforded matter for grave reflection. The lecture and laboratory fees amounted to only £418. 16*s*. 6*d*., while the two professors were paid £550; and then there were further payments for instructors in the laboratory of £154, making altogether upwards of £700. Now this was a state of finance which, if applied to any of themselves individually, would soon send them to Basinghall Street. He contended that their educational arrangements ought to be self-supporting, and the reason they were not so was that the Council had lost sight of the primary object of their association, a compulsory examination. They appeared to have given that question up, either in disgust or despair, and they made no suggestion, nor said anything in the Report, as to their hopes or intentions respecting it. He hoped the next Council would discuss the matter and see if anything could be accomplished in that respect. His impression was that if the money that had been spent at the top of their house had been applied towards obtaining an Act of Parliament for the purpose alluded to, they would have obtained it by that time. The Council, he admitted, stood on vantage ground, and were probably better able to judge of the matter than Members not on their Board; but still many of them had expressed similar views to those he entertained, and he regretted there had been no suggestion of action by the Council in that direction. He apprehended that unless something was done to make the educational part of the establishment self-supporting, it would continue to be a subject for discussion and disagreement at their annual meetings. They possessed everything they required for a flourishing institution except the requisite number of students, and for these there was not a sufficient inducement for them to incur the expense, as there was no adequate return. He next called attention to the sum of £94 charged for law costs during the past year, and asked for an explanation of this item. The financial statement relating to the Journal he considered to be unsatisfactory, for as the Journal was now the property of the Society, he thought the Council ought to furnish a fair balance-sheet of receipts and expenditure, instead of merely giving the balance of £173, which appeared against the Society. Few journals were so well supported by advertisements, the returns for which must be very large; and he thought it ought to bring a profit to the Society instead of entailing a loss. Then, again, he thought the Benevolent Fund might be put upon a better footing, considering the perfect organization they possessed for working it. He should like to see its eleemosynary character got rid of, and annuities for Members and their widows established instead. If that were done, Members would contribute to it more generally, and they would soon have a sufficient fund to enable them to grant annuities of £50. He was quite ready to admit, however, that the Council had shown a readiness to render assistance from the fund when deserving cases were brought under their notice; but this assistance had hitherto been limited to grants. There were many poor men in the Society, in fact, as a class they were poor; nevertheless they disliked being the recipients of the bounty of the Society, but would gladly contribute to a fund from which they would be entitled to a provision in old age, or for their widows.

Mr. Preston said as allusion had been made to the Journal account, he could, as one of the auditors, bear testimony to the satisfactory nature of the statement which had been laid before the auditors relating to that department. The management of the Journal had evidently been greatly improved, for instead of an enormous balance appearing against the Society it was now comparatively nominal. From the figures that were placed before them by the Secretary, he had reason to believe that the present deficit would in a year or two be turned into a profit. He had hoped that the statement

of the receipts and expenditure connected with the Journal would have been submitted to the meeting, feeling assured that it would have afforded the same satisfaction that it did to the auditors.

The PRESIDENT said the Council had decided not to bring the Journal account forward that year, but no doubt if the meeting expressed such a wish it would be produced another year. He however did not think it would be a politic course to pursue. The Members might be sure that the Council honestly and faithfully executed their charge with reference to it. The cost to the Society had been decreased during the past year to the extent of £500, so that now, after supplying the Members and Associates and Apprentices with 3000 copies monthly, gratuitously, the charge to the funds of the Society was only £173, which was little more than the cost of the postage and wrappers.

Dr. EDWARDS, of Liverpool, thought if some of the Members present had looked at the report through rose-coloured spectacles, Mr. Collins had criticized it with a pair of blue ones. He had taken exception to the law charge, and had asked for what had the money been paid. The answer was that in attending on the Council and assisting as their solicitors in procuring the exemption clause inserted in the Juries Act, part of this charge was incurred; and surely the Members generally would not complain of such an item. If they had introduced and carried a Bill of their own for the purpose, it would have cost £400 or £500.

Mr. WAUGH, referring to the remarks made by Mr. Collins with regard to the Journal, said that no doubt that gentleman, as well as the Members generally, would be glad to know that the cost of the Journal beyond the amount expended for wrappers and postage was only £4. Of the £173 that had been referred to, £169 was actually spent in postages and wrappers.

Mr. COLLINS was happy to find that his remarks on the law charges had elicited so satisfactory an answer. He was generally of opinion that money spent in law was uselessly and wastefully spent, but he was free to admit that here the money had been well spent.

Mr. GEORGE EDWARDS, of Dartford, said there was another way in which law expenses had been incurred, not, it was true, by any large amount, but by a number of small ones, and that was in preventing persons from using the name Pharmaceutical Chemist who had no right to it. As the importance of this privilege became more apparent, the number of those anxious to take advantage of it increased, and many from time to time adopted the title Pharmaceutical Chemist, whom the Council, in the interests of the Members, were obliged to deter from the continuance of such practice.

Mr. SAVAGE, of Brighton, said it was satisfactory to find that Mr. Collins, who had charged others with looking at the affairs of the Society through rose-coloured glasses, had at last seen through the same medium himself. A little opposition often did good, for it stimulated some to greater exertion, and sometimes produced explanations that were satisfactory to all. It was gratifying to Members of the Council to find that their conduct had met with general approval. The Juries Act would, he believed, be of greater advantage to the Society than many at first imagined. It brought the Society more prominently before the public, and gave them more influence, which they would be enabled to use for the general good of the Members. The withdrawal of the Poisoned Grain Bill was an evidence of this, although, unfortunately, in that case the objectionable Bill had been replaced by another equally, if not more objectionable, but which would, no doubt, meet with a similar fate. It would be requisite for them to put themselves in communication with the Members of Parliament for their respective districts, and make them acquainted with the real bearings of the measure. With reference to the Benevolent Fund, he admitted that it had not done so much good as they had expected and still believed it was capable of doing. It was very desirable to make an appeal to the Members on behalf of the fund, and, as soon as it was raised to £10,000, they could enter on the question of granting annuities.

Mr. BALDOCK was of opinion that they would have more difficulty than Mr. Collins seemed to anticipate in getting Parliament to recognize them, and give them all the powers they required as an independent and separate body. The College of Dentists had met with the same difficulty, but were nevertheless allowed to be engrafted on to the College of Surgeons. A somewhat similar proposition had been made some time

ago to place Pharmaceutists under the Medical Council; and he thought such an arrangement would not prove detrimental to their interests. He differed from Mr. Collins and Mr. Kent respecting the laboratory fees, and thought they ought not to be made lower than they were at present. With regard to the Journal, he thought they had nothing to complain of in the amount it cost them, and that the quality of the matter was rather improved than otherwise.

Mr. BRETON, of Brighton, thought the Journal was much more valuable to Country Members than to London Members, and wished to know whether it would not be possible to reduce the cost of it to the Society by making it more available for trade communications, which it would be if it were published once a fortnight instead of once a month. The plan adopted for the election of Local Secretaries was, he thought, a step in the right direction. Something might perhaps be done to give Members in the country better means than they now had of making a proper selection of Members of Council. On the whole, he considered that they had much cause for congratulation on the prospects of the Society.

Mr. COLLINS wished to explain, with reference to what had been said by a previous speaker, that he did not advocate a reduction of the fees to students, but the adoption of such a policy as would make the educational part of the establishment self-supporting.

Mr. MACKAY, of Edinburgh, said he would be sorry to see any change made in the character of the Journal. In the north they felt proud of the Journal, and had always done so. He recollected that some time ago, in speaking of their Journal, Dr. Christison remarked that if the Pharmaceutical Society had done nothing more than produce their monthly publication, they were entitled to the hearty thanks of medical men and pharmaceutists, among whom it had been so extensively circulated, and had done so much good. He confessed that in the north they used to consider that the Journal cost too much money, and now that the outlay had been so greatly reduced, he was surprised to find so little credit given to the Council for the retrenchment they had effected. He was not betraying the secrets of the Council when he stated that estimates were obtained in connection with every branch of the expenditure, the result of which was apparent to the meeting. They were enabled to come before them and say that, compared with last year, there was a saving of £500, and that the Journal had been produced for £4 over the cost of wrappers and postages. The Council were not disposed to sleep over the matter, and if they could show them next year a still further reduction, they would only be too happy; and he thought he was not asking of them too much to leave the matter in the hands of the Council. The Journal, thanks to the Secretary, was delivered to the Members with the greatest punctuality. In Edinburgh a gun was fired every day at one o'clock, and once a month the postman brought the 'Pharmaceutical Journal,' and placed it on the counter of every Member, free of all expense, with the same regularity, and almost with the same punctuality.

The motion was then put to the meeting, and carried unanimously.

The PRESIDENT said it was open to the Members to bring before the meeting any question affecting the general interests of the Society.

Mr. KENT wished to inquire whether some better arrangement could not be adopted for the election of the Council. Seventeen names had been submitted to them this year, out of which they had to select fourteen. In conformity with the directions on the voting-paper he had scratched out three names, but he knew not whether he had done right or wrong, and it might be that he had struck out the three best men. He had looked for the name of their friend Mr. Bottle in the list, and was sorry to find it was not there, and that they were to lose his services in the Council. He thought if the number of attendances of each member of the Council at the Council meetings was appended to his name, it would afford the Members some guide in the selection of business men.

The PRESIDENT said the names of those who attended the Council meetings were published every month in the Journal.

Mr. WAUGH observed that it was competent for the Members to nominate any number of candidates they thought proper; but if they did not do so, the Council had to supply the deficiency by nominating the requisite number. It was only in the event of the Members omitting to nominate, that the Council did so. In voting, the

Members might scratch out as many of the names as they pleased, but there appeared to be no desire on the part of the Members to change the Council.

Mr. HUMPAGE said it was generally felt that Members had no data on which to act in selecting names for the Council. The number of attendances was not an unusual test of fitness for the office, and the scratching of a name for non-attendance would not imply a want of respect, but a feeling that the party could not give the required time to the business of the Institution. He was the last man to say anything that would not imply the fullest confidence and the highest respect for those who were or had been members of the Council, but it appeared to him that there was a radical defect in the mode of election. When the retiring members of Council announced their intention to serve again if re-elected, it was not to be expected that new men would come forward, for the voting was always in favour of those who had already been in office. If some plan could be adopted for, say, one-third of the Council to retire every year without being eligible for re-election, they would infuse every year into the Council a certain number of new, active, and intelligent spirits. He saw difficulties in the way of this, as it would sometimes deprive them for a time of the services of men they could not afford to lose from the Council. He hoped, however, that this subject would receive attention. The Society did not progress as much as it ought to, yet they had much reason to rejoice at its present position. When they considered what they were twenty-three years ago, they must all feel that though they had not done all that the most sanguine anticipated, they had done much more than some of the oldest Members ever contemplated. He attributed their want of more rapid advancement to their not being thoroughly understood. Referring to the financial report, he found only forty-four apprentices contributing to the Society, which he thought was a very small number, considering there were 2000 Members. The Members ought to make it a *sine qua non* that every apprentice they took should be registered in the Society, and if it could not be otherwise accomplished let them give up a portion of the premium in lieu of it. They would then have better materials to work with, and what they lost in premiums they would gain in the increased proficiency of their apprentices. He congratulated the Members on the state of the Journal account. Three years ago he was one of the auditors, and he then expressed his dissatisfaction at the Journal costing the Society the large sum of £900 a year. He did not impeach the integrity of the Council, but he advised them to look to the matter, and the result had been highly satisfactory. If they wished their apprentices to appreciate the advantages of the Institution, they should take the trouble as individuals to point them out to them. He saw at the Conversazione an intelligent youth who was a student in the laboratory, and on asking him how it was there were so few students there, he replied that the apprentices generally did not understand the benefits to be derived from studying there. He thought that by inducing them to enter for shorter periods at correspondingly reduced fees the number might be increased. Some good might also be done by impressing upon parents the importance of their sons entering for some time in the Laboratory as a means of rendering them thoroughly practical men.

Mr. DEANE considered, with reference to the election of Council, that the test of attendance at Council meetings was very fallacious, as this formed by no means the most arduous part of the duties of a Councilman. It might be that from some cause a member was not able to be present at a Council meeting, and therefore his name would not appear in the list, yet he might have devoted many hours, two or three times in the month, at Committees, which were quite as important as meetings of Council. A similar proposition to that now made was adopted at a meeting some years ago, but it was not considered by the Council to be wise or just to act upon it in any other way than that of publishing every month the names of those who attended the Council.

Dr. EDWARDS remarked that the Members were very much in the position of having too much choice in the selection of members of Council, and in consequence they neglected it, and threw it on to the Council to nominate candidates for them. The Council wished to be relieved of that duty, but he did not think compulsory retirement without being eligible for re-election would be satisfactory. The working of that plan would be to deprive them of the services sometimes of those they would not wish to lose. The number of attendances was not a true criterion of fitness for office.

Of necessity, the number of attendances of the London members of Council would be greater than those of country members. When the latter received their notices of meetings they hesitated to put the Society to the expense attending their travelling, unless they saw that the business to be transacted by the board was of sufficient importance to justify them in doing so. But then, although the number of attendances by country members of Council was less frequent than that of London members, the time occupied in such attendances was greater, for when they came from a distance they had often to leave their homes for two or three days at a time. It was advisable for the proper discharge of the duties that members of the Council should be eligible for re-election, and that the majority of them should be living in London and its immediate neighbourhood. As a country member, he advised them to nominate London men and to leave the selection to their London brethren, who had better opportunities of judging of their qualifications. He might remark, with regard to what had been said respecting the number of apprentices, that the forty-four apprentices who were inserted in the financial statement as paying annual subscriptions did not represent the whole number belonging to the Society. When they saw the June register, he thought they would find a far greater number. Generally, throughout the country, the apprentices were more alive to the advantages of the Society than they had formerly been, and he hoped Members would endeavour to encourage and extend this feeling.

Mr. WATTS said, it required all the vigilance of the Society to watch the movements of Parliament, and, referring to the "Poisoned Grain Bill," thought there appeared to be an increasing feeling in Parliament towards the stricter preservation of game, which no doubt gave rise to the introduction of that measure. It appeared that the first Bill had been withdrawn, but that a more pernicious one was substituted for it which would still require watching. He agreed with Mr. Collins that it was desirable to infuse new blood into the Council, and he should like to see Mr. Collins there, although he did not expect that even Mr. Collins would be able to effect much improvement in the financial statement.

Mr. WAUGH had just ascertained from reference to the books that the number of apprentices registered in connection with the Society, instead of being 44 was between 450 and 500. As one of the oldest members of the Society, he must be allowed to express his satisfaction at finding this amount of young blood preparing for admission through the examinations.

Mr. COLLINS was happy to hear the statement just made; still he thought there was something yet to be done to put the Society on a safe and satisfactory footing. He had just had a motion put into his hands which he was asked to move, and as he approved of it he had no objection to do so. It was to the effect:—That this meeting is of opinion that the Council of the Pharmaceutical Society, in conjunction with the general body of pharmaceutists, should use all their influence to obtain an Act of Parliament for the regulation of pharmacy, and that all chemists and druggists who are in business at the time of the passing of such Act be allowed to register as Pharmaceutical Chemists by the payment of a small fee.

He had had a long talk with a Member of Parliament who was well versed in medical matters, and he had expressed his readiness to undertake the conduct of a well-prepared measure through Parliament. That gentleman was of opinion that the trade ought to be protected, as a means of protecting the public.

Mr. BOURDAS seconded the motion, and hoped the Council would call a Special Meeting, and discuss and consider the matter. They had been successful in the case of the Juries Bill, and would probably be so with such a measure as he now advocated.

The PRESIDENT wished to remind the mover and seconder of this motion that the effect of it if carried out would be to nullify the Pharmacy Act. He did not think such a Bill would stand much chance.

Mr. GEORGE EDWARDS said the first effect of such a measure as this motion contemplated would be to throw them back ten years. They had made an offer ten years ago to the trade to join them, and at the same time they gave a pledge to the Government and to the country that in future all taking the name of Pharmaceutical Chemists should have their qualifications tested by examination. Any attempt to limit the sale of drugs (whether wise or foolish he could not say) would, he had no

doubt, be resisted; and what chance, he asked, would they have in Parliament with such a measure?

Mr. BOURDAS said he would limit the restriction to the making up of prescriptions.

Mr. EDWARDS would be glad to know how the word prescription was to be legally defined. He should be much surprised if any member was prepared to give a legal definition of it. Was it a prescription if written in English, or must it be in Latin? The difficulties were so great, that he felt satisfied the House of Commons would not listen to it for a moment. If they looked at some of the proposed changes as part of the public, they would see them in a very different light. The restriction proposed amounted to this, that a person residing in the country might have to send a distance of ten or twelve miles for a little hartshorn for a fainting fit, or any other harmless drug that was wanted on an emergency, before he could find a Pharmaceutical Chemist. We did not like grocers selling drugs, but druggists sold tea, and many other articles that were not strictly drugs. Even in London chemists and druggists combined other trades with that of a druggist. There was not a shop in Regent Street that did not sell smelling-bottles, sponges, brushes, etc.; but who would say that a smelling-bottle was a drug? What right therefore had they to ask Parliament to prohibit grocers from selling drugs, and yet permit druggists to sell spices? Whenever they entered practically into the question they would find it surrounded with a mass of difficulties, and they could not have a better illustration than in the seconder of the motion stating that he did not mean what it expressed, and in the mover being anxious to strike out the bottom line. Even the restriction proposed in the "Poisoned Grain Bill" would not, he thought, be sanctioned, for to say that grain should not be poisoned was absurd. Wheat was constantly mixed with poisonous substances, such as bluestone, before being sown, to protect it from disease. He recommended the mover of the motion to take Lord Melbourne's advice,—"Can't you leave it alone?"

Mr. BURDEN thought the adoption of the resolution would lead to no practical result, and he therefore would move that they should take the subject into consideration that day six months. It was a mistake to say the Society had met with no success. It had progressed slowly but safely, and everything that was fixed on a solid foundation required time to mature it. The motion, after an appeal to the mover and seconder, was withdrawn.

The PRESIDENT said that in asking if they had any other matter to bring before the meeting, he thought that something might be proposed with reference to the Bill before Parliament relating to Weights and Measures. He should be glad to know the opinion of the meeting with reference to this Bill, and whether they thought it desirable to take action upon it. The alterations which had been made in the weights to be used in pharmacy under the new Pharmacopœia, made the existing arrangements so unsatisfactory, that he thought it high time something was done by the Legislature to simplify and settle the question. There was a very general feeling in favour of the metrical system, and it might be worth their consideration whether they would petition Parliament in favour of this Bill. It was proposed that the use of the metric weights and measures was to be permissive for three years, and after that compulsory. He had a good deal himself to do with foreign weights and measures, and not only did he find them very easy to understand and use, and that the use of them greatly simplified calculations, but he might say that the introduction of this system, so far from entailing inconvenience, would facilitate business.

Mr. WATTS said he approved of the proposition to introduce the metrical system of weights and measures in this country, and he would beg to move that a petition be prepared in favour of the Bill, that it be sealed with the corporate seal of the Society, and forthwith presented to Parliament.

Mr. KERSHAW seconded the motion.

Mr. KENT asked whether the subject had been before the Council, and whether the Council approved of the measure.

Mr. WAUGH doubted whether it would be safe for them to decide on a petition in favour of the Bill that day. He should be glad to have a little more time to consider the measure before deciding either for or against it. A sad mess had already been made by altering the weights for the British Pharmacopœia, and he hoped they were not going to make it worse.

The PRESIDENT said, as an advocate of the metrical system, he had thought it his duty to bring the subject under the notice of the Society, but he had no wish for anything to be done hastily.

Mr. BURDEN thought there should be some delay before they decided on petitioning Parliament, in order that they might be able to consider the subject.

Mr. WATTS said the subject had been for years before the public, so that they had had abundance of time to consider it, and it was important if they took action with reference to it that they should do so at once.

Mr. KENT suggested that a special meeting of the members should be called for the consideration of the subject.

Dr. EDWARDS said this was a great international question, and not one that could be settled by a few chemists and druggists. The subject had been debated for many years, and the principles involved had been asserted and recognized by men of sound sense and ability. We were much behind our neighbours in this matter, but no doubt we should ultimately have to adopt the metrical system as a matter of national policy. If it were adopted, they would have no difficulty in learning it in three months. He thought the system was far preferable to the one now in use, and that they would do well to give the measure before Parliament their cordial support.

Mr. SYMONDS would be very glad to see the metrical system introduced, as there could be no doubt of its being far preferable to our present system.

Dr. REDWOOD said he should be very sorry to find the meeting committed to the motion before them, because, individually, he knew little or nothing of the details of the Bill referred to, and it appeared that most of the gentlemen present were similarly circumstanced. He thought it would be a great mistake for them to pledge themselves to the support of a Bill, the exact details and bearing of which they were not acquainted with. The question they had to consider was, not merely whether the system of weights and measures at present in use in this country was defective, or whether the metrical system was better, but whether the method proposed in the Bill before Parliament was the best or right method for improving our admittedly imperfect system. He had no doubt that the metrical system was better than that now in use in this country; but judging from what the President stated of the provisions of the Bill, and this was all the information he had on the subject, he should be inclined to hesitate before expressing approval of the Bill. It proposed, as he understood, to render compulsory in three years' time the substitution of an entirely new system of weights and measures for all transactions throughout the country, in which system the pound and other denominations now in use were to be materially altered. He thought this proposition should be maturely considered by the Council before they came to the members for an expression of opinion upon it.

After some further conversation the motion was altered, and a resolution was ultimately passed to the effect,—

"That the Council be requested to consider the Bill now before Parliament for decimalizing our existing system of weights and measures, and for establishing an accordance between them and those of foreign countries, and that the Council be requested to take such steps as they may deem desirable."

The meeting then proceeded to appoint scrutineers to receive and examine the voting-papers for the election of the Council for the ensuing year.

Mr. BURDEN then moved, and

Mr. PRESTON seconded, a vote of thanks to the Council for their services during the past year.

Mr. BOTTLE returned thanks on behalf of himself and colleagues.

Mr. ANDREWS moved, and

Mr. KENT seconded, a vote of thanks to the President, which was carried unanimously, and duly acknowledged.

The meeting was then adjourned to Friday morning the 22nd, for the reception of the report of the scrutineers.

ADJOURNED MEETING.

Friday, 22nd May, 1863.

MR. SQUIRE, PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their Report, as follows:—

We, the Scrutineers appointed at the Twenty-second Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting-papers committed to us, and report the following results:—

Voting-papers received.....	594
Disallowed for informality ...	8
	586

Baldock	289	Hanbury	566	Morson.....	560	Sandford	495
Bird	500	Haselden	525	Palmer	234	Savage	490
Davenport ...	483	Hills	520	Proctor	422	Thomas	313
Edwards, G.	503	Horner	444	Reynolds	470	Waugh	503
Edwards, J. B.	528						

THOMAS KENT, *Chairman.*	WILLIAM SYMONS.
WILLIAM WATTS.	MAURICE HOWELL.
JOHN BARNARD.	FREDERICK ANDREWS.
SAMUEL GALE.	GEORGE KERSHAW.
JOSEPH KITTLE.	CHARLES COLES.
THOMAS BURDEN.	CHARLES E. TURNER.

The following Members were therefore declared to constitute the Council for the ensuing year:—

COUNCIL.

BIRD, WILLIAM LIONEL, 42, Castle Street, Oxford Street.
BUCKLEE, WILLIAM HENRY, 86, New Bond Street.
DAVENPORT, JOHN T., 33, Great Russell Street.
DEANE, HENRY, Clapham.
EDWARDS, GEORGE, Dartford.
EDWARDS, JOHN BAKER, Royal Institution, Liverpool.
EVANS, HENRY SUGDEN, 52, Hanover Street, Liverpool.
HANBURY, DANIEL BELL, Plough Court, Lombard Street.
HASELDEN, ADOLPHUS FREDERICK, 18, Conduit Street.
HILLS, THOMAS HYDE, 338, Oxford Street.
HORNER, EDWARD, 20, Bucklersbury.
MACKAY, JOHN, 119, George Street, Edinburgh.
MEGGESON, GEORGE, Wandsworth.
MORSON, THOMAS N. R., 38, Queen Square, Bloomsbury.
PROCTOR, BARNARD S., 11, Grey Street, Newcastle.
REYNOLDS, RICHARD, 13, Briggate, Leeds.
SANDFORD, GEORGE WEBB, 47, Piccadilly.
SAVAGE, WILLIAM DAWSON, 65, Edward Street, Brighton.
SQUIRE, PETER, 277, Oxford Street.
STANDRING, THOMAS, 1, Piccadilly.
WAUGH, GEORGE, 177, Regent Street.

There being only the requisite number of Candidates proposed for election as Auditors, the Chairman declared the following, who had been nominated and had signified their willingness to accept the office, duly elected:—

AUDITORS.

BARRON, FREDERICK, 2, Bush Lane, Cannon Street.
CARR, JOHN, 171, High Holborn.
DAVY, CHARLES, 100, Upper Thames Street
MCCULLOCH, WILLIAM, 5, Coleman Street.
YATES, BENJAMIN, 25, Budge Row, Cannon Street.

The Scrutineers further reported that they had examined the voting-papers for Local Secretaries returned with the voting-papers for the Council, and handed the list to the Chairman, representing 159 towns; but for some important towns no returns had been made.

Voting-papers received	421
Disallowed from being insufficiently or not filled up	45
	376

The Chairman of the Scrutineers (Mr. Kent) suggested, for the consideration of the Council, with reference to the appointments, that in those towns in which the highest number of votes were equal, the Secretary for the past year (if his name were included) should be requested to undertake the duties; and in those places where the highest numbers were equal, and which did not include the name of the Local Secretary for the past year, that preference should be given to the member who had been longest on the Society's register.

The Bill for decimalizing the weights and measures, referred to at the meeting on Wednesday, having that morning been published, copies were distributed among the members present; and after some discussion it was moved by Mr. Andrew, seconded by Mr. Watts, and resolved unanimously,

"That in the opinion of this meeting it is desirable that the Bill now before Parliament, entitled 'A Bill for decimalizing our existing system of Weights and Measures, and for establishing an accordance between them and those of Foreign Countries,' should be printed in the next number of the Journal, with a view of eliciting the opinion of the members of the Society throughout the country upon the subject; and that a meeting of the members be held at the Society's house to consider the desirability of petitioning in favour of the said Bill."

Votes of thanks having been passed to the Scrutineers and to the Chairman, the meeting separated.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Twelfth General Meeting, held at the Royal Institution, Colquitt Street, on Thursday evening, March 26, 1863; the President, J. Shaw, Esq., in the chair.

Several donations were announced, and, amongst others, specimens of Crucibles and other apparatus, from the Patent Plumbago Crucible Company, of London.

The President announced that he intended to give a prize to botanical students, instead of the prize which it has been customary to offer to chemical students.

J. H. T. Ellerbeck, Esq., read a paper on "Cobalt and Nickel." After mentioning the sources, etc., of these metals, he went on to describe the different processes, manufacturing and analytical, used for their separation, and the various precautions necessary. He dwelt more especially on those methods in which the cobalt is separated:—First, by the formation of the double nitrite of cobalt and potash ($Co_2O_3 2NO_3 + 3KONO_3 + 2HO$); and secondly, by the peculiar affinity of the carbonate of lime for carbonates of the metal, as suggested by Mr. Thompson. A few experiments accompanied these observations.

Mr. Whittbread read a paper on "Shale Oil," in which he described principally the properties and means of obtaining the crude oil.

After a short discussion, a vote of thanks was passed to Messrs. Ellerbeck and Whittbread, for their papers, and the proceedings terminated.

The Thirteenth General Meeting, held April 9, 1863; the President in the chair.

The following donations were announced:—The 'Pharmaceutical Journal' for April, from the Society, and the 'Technologist' for April, from the Editor.

Mr. J. Abraham made some remarks respecting the Ordeal Bean of Calabar. He said that it had recently been found by Dr. Argyll Robertson, of Edinburgh, to be a

valuable ophthalmic agent. An extract made from it was found to cause, when locally applied, contraction of the pupils of the eyes. He would be glad to know where a supply could be obtained. He had been favoured with three of the beans, but only for a special application. They were described and figured in a paper by Professor Christison, in the fourteenth volume of the 'Pharmaceutical Transactions.'

The President announced the conditions of competition for his prizes. They are to be awarded to botanical students, who are members or associates of the Association, and either apprentices or assistants to chemists and druggists. For the first prize, of one guinea, a minimum number of four competitors must present themselves for examination on a day to be appointed, which will be about the middle of September next; and any student as above shall be eligible for examination, on sending in his name, or motto and address, in confidence, to the Secretary, not later that the 1st of September next. A second prize, value half-a-guinea, will be offered, provided that not less than six competitors present themselves for examination (that is, two in addition to the four named above). The examination will embrace the following subjects:—1. Botanical Classification; the natural and artificial systems at present in use in Great Britain. 2. Flowering Plants only, especially medicinal and poisonous British ones. 3. Vegetable Organography. 4. Properties and Use of Medicinal Foreign and British Plants. 5. Dried Plants; figures of plants, and fresh plants, will be presented for identification.

The paper of the evening, on "The genus Cocens, and its products," by H. S. Evans, Esq., F.C.S., was read by the author, who illustrated his subject by numerous drawings and specimens. A vote of thanks to Mr. Evans, for his interesting paper, concluded the proceedings.

Fourteenth General Meeting, held April 23, 1863; the President in the chair.

The following donations were announced:—A specimen of Carbolic Acid, from Messrs. Higgins and Cuttle; the 'Chemist and Druggist' for April; and a number of the 'Grocer.'

Mr. Martin Murphy read a very interesting paper on "Kelp, and its products," at the conclusion of which a short discussion took place.

Mr. Samuel Banner exhibited several specimens of Lubricating Oil, and, amongst others, some made from petroleum by Messrs. Prentiss and Company, of Birkenhead. The lubricating power of the oils was shown by means of two ingenious machines made for the purpose, and the oils of Messrs. Prentiss were proved to be quite equal to sperm oil in lubricating power.

A vote of thanks was passed to Messrs. Murphy and Banner for their communications, and the Meeting separated.

The Fifteenth General Meeting, held May 7, 1863; J. Shaw, Esq., President, in the chair.

The Secretary announced several donations, including several volumes of books on chemical and medical subjects from Mr. N. Mercer.

Mr. Abraham presented to the Museum a fine specimen of the roots of the *Veratrum viride*, which had been forwarded to him by Dr. E. Cutter, of Massachusetts. He likewise exhibited some specimens of the Ordeal Bean.

Dr. Edwards made some remarks respecting a sample of carbolic acid presented to the Museum at the last meeting by Messrs. Higgins and Cuttle. He stated that it was known as French creosote, and was a product of coal-tar. It was a mixture of carbolic acid and eupion, and did not appear to contain any other hydrocarbon. It was very sensible to temperature, becoming solid at 50° or 55°. It was likewise very sensible to light, and gradually changed colour—first becoming pink, and then red. It possesses an agreeable odour, and equally anti-putrefactive properties to creosote.

Mr. Mercer remarked that most of the creosote of commerce was only impure carbolic acid. He had only met with one sample that solidified, but this was probably owing to the other samples not containing so much carbolic acid.

Mr. Holt exhibited specimens of lead-pipe and sheet-lead electro-plated with tin. Lead coated so has been proposed to be used for water-cisterns and pipes.

Dr. Nevins said that although tin was less easily acted upon than lead, yet the combination of the two metals in the manner alluded to was not likely to have a beneficial effect; but, on the contrary, the effect of a mere scratch, and the consequent removal of a slight portion of the tin coating, would be to set up galvanic action, and the lead, in consequence, would be more easily acted upon than when used alone.

Dr. Edwards corroborated the remarks of Dr. Nevins, and further stated that there was a great deal of difference between the corrosion of lead and the solution of lead. Tin had the effect of precipitating the lead which got into solution; and although the water held in a lead-cistern, coated with tin, might not contain any lead in solution, yet it was very certain, as was proved by experiments he had made in conjunction with Dr. Nevins, that it did not prevent the actual destruction of the lead; and although such water might not be poisonous, yet, owing to the galvanic action set up, if the surface was abraded, the cistern would soon be destroyed. In one case which he had examined, a cistern made of lead, in which was an accidental admixture of tin, was eaten out by well-water in six months, the lead being rapidly precipitated in the form of sulphate, etc.

Mr. Mercer said that the covering of lead with tin was all very well on theoretical grounds, provided we could obtain a perfect coating, and prevent that coating from being abraded; but this he thought was not possible, as by long-continued use the surface was sure to be injured.

Dr. Edwards presented, through the President, a copy of the 'Memoirs of George Wilson' to Mr. Matthews, a student in the Laboratory class, as a prize for his steady application to his studies.

The paper of the evening was then read; it was on the "Cultivation of Chinchona in India," by Dr. J. B. Nevins.

ON THE INTRODUCTION AND CULTIVATION OF CHINCHONA IN INDIA.*

BY J. BIRKBECK NEVINS, M.D. LOND.

General Description of the Chinchonas.†—If the age of chivalry is really past, which we may fairly be excused for doubting, with the deeds of a Havelock and a Garibaldi still ringing in our ears, the days of unostentatious self-devotion in the discharge of duty, and in the endeavour to promote the welfare of others, are still in the noonday of their tranquil brightness, and show no signs of obscurity or night. If there is no chasm for a Curtius to leap into, with Rome for a spectator and the world for a laudator, Mr. Markham's narrative shows that there are not wanting men who have manifested equal courage, with only a Peruvian bark-gatherer for a witness, and with no poet to tell the tale; and if the tranquillity of Socrates, when drinking the poisoned cup, has furnished a theme for the admiration of mankind, we shall not err in ascribing a large share of his spirit to the naturalist. Dr. Walker, of the 'Fox' Arctic Exploring Expedition, who, with no Xenophon to record the fact, ate herbs believed to be poisonous, and calmly awaited the result, in order that the crew might have the benefit of fresh vegetable food in their necessity, should the only plants they could discover prove by their effects upon himself to be wholesome instead of deleterious, as was feared when he ate them.

I have been led into these remarks by Mr. Markham's interesting work on Peru and India, which contains an account of the many failures, and the ultimately successful attempt to introduce the Chinchona-trees into our Indian possessions; but, in order that we may be more able to appreciate the dangers to be encountered and the difficulties to be overcome in accomplishing this undertaking, we will first take a slight survey of the natural habits and situation of these most valuable and important trees.

The Chinchonas, or the trees which yield Peruvian bark, grow upon the slopes of the Andes over an extent of about 1700 miles; but they are never found further north

* 'Travels in Peru and India,' by Clements R. Markham, F.R.G.S. Murray. 1862.

† These trees have long been called Cinchonas, by the accidental omission of the "h." Mr. Markham has restored the proper mode of spelling the name, by showing that it was given in compliment to the Countess of Chinchon, who was cured by the bark and made it famous in Europe; whence, also, one of its names, "Countess's Bark," was derived.—*J.B.N.*

than 10° or 11° north latitude in the forest of New Granada, or further south than 19° south latitude in those of Southern Peru and Bolivia. They are therefore strictly tropical plants; but they grow only at such an altitude upon the mountains, that the heat resembles that of an English summer, rather than the temperature of a torrid zone. It is curious, however, that even in their native home, and under circumstances which present no apparent difference, there are districts, here and there, extending over some degrees in the whole, in which either no Chinchonas grow at all, or such as are met with are destitute of any medicinal value and are therefore entirely unworthy of cultivation. Unfortunate ignorance of this fact has led the Dutch into an immense expense in the transmission and cultivation of worthless plants into Java, which are now abandoned, after yielding no other profit than that of furnishing a lesson from which other cultivators may derive a valuable caution. Not only, however, are these trees thus limited within definite boundaries of latitude, but they are also dependent for their growth upon a certain elevation, which has to be very considerable in the case of many of the species. The tree which is capable of growing at the lowest level is the one which yields red bark (*Chinchona succirubra*), and it flourishes between 2500 feet, or an elevation nearly as high as the summit of Snowdon, and 5000 feet,—or an altitude equal to the top of Ben Nevis; whilst the trees which yield the grey and yellow bark range between 7000 feet, or the level of the Hospice of St. Bernard, and 9000 feet, or the summit of Mount Sinai. Within these limits the greatest diversity exists in the soil and situation chosen by each species; for whilst the red-bark tree buries its roots deep in a rich soil many feet thick, the *C. Condaminea*, one of those which yield grey bark, grows in the wildest and most inaccessible regions, in clefts of rocks without an inch of soil; and the *C. micrantha*, which also furnishes grey bark, grows in low moist places, with its beautiful panicles of flowers drooping over the rivers into the very water.

In the character of the trees, as well as in their situation, there is also a wide diversity; for whilst the red and yellow barks, *C. succirubra* and *C. Calisaya*, attain to the dimensions of large forest-trees, being from sixty to eighty feet high and twice the girth of a man's body, there are others which attain a height of forty to sixty feet, but with a diameter of not more than a foot, or of a few inches only; whilst others, again, varieties of the *C. Condaminea* and of the *C. Calisaya*, are mere shrubs, never exceeding a few feet in height.

With all these differences, however, there is one circumstance in which all are agreed: and this is, the necessity for about nine months of rain in the year, and the steaming moisture arising from a tropical forest during the remaining three, which may be called the dry months. This indeed it is, which has proved the greatest difficulty to be overcome in extending the growth of these invaluable trees to other regions of the world. There are plenty of places with a tropical sun and an elevation of 7000 or 8000 feet above the level of the sea; but the difficulty has been very great of finding situations which, in addition to these requisites, shall also possess the necessary amount of moisture—an amount of which in this country we cannot form a conception.

It is hardly necessary to say that Peruvian bark yields quinine, a substance as familiar as our daily bread; but it may not be so generally known that the bark which was originally used, and which was the means of gaining its high reputation for the Jesuits, or Peruvian bark, contained little or no quinine at all, but another alkaloid, called Chinchonidine, which differs from quinine in many important respects, though agreeing with it in the most important of all, viz. its power of curing intermittent fever. These two alkaloids, and a third, viz. Chinchonine, may be used almost indifferently for the cure of ague, and efforts have therefore been made, which have at last been crowned with success, to introduce all the species yielding these three valuable constituents into our Indian possessions. The importance of this measure may be estimated in some degree by the fact that the Indian Government has of late expended £50,000 a year in the purchase of quinine alone; and the benefit resulting from this expenditure is shown in the reduced mortality from fever amongst the troops; for whilst in 1830 nearly four soldiers died in every hundred who were attacked, only one in a hundred died under the same circumstances in 1856.

The health-restoring properties of the Chinchona have long been known, but it is only of late that we have learnt its beauty and fragrance in the forest. The leaves are large,

and have a shining green surface, with crimson veins and leafstalks, which are so striking as to render the clumps of these trees visible at a very great distance, and it is by this means that the *cateador*, or bark collector, directs his cause aright. He climbs the most lofty tree he can find, and soon discovers the groups of Chinchonas by the peculiar reflection of light from their surface, which is easily observable, even in these endless expanses of forests. Humboldt says of the *C. Condaminea:* "This beautiful tree, above sixty feet high, and six inches in diameter, seems always to aspire to rise above its neighbours in the dense forests, and as its upper branches wave to and fro in the wind, their red and shining foliage produces a strange and peculiar effect, recognizable from a great distance." The flowers are usually small, and hang like clusters of lilacs, being generally of a deep-roseate colour, dark crimson within the tube. The notchings of the flowers are bordered with white curly hairs, making the individual florets in this respect resemble the lovely flowers of the Buckbean, or the bog Asphodel, of our own marshes and boggy hillsides, whilst the delicious fragrance scents the air in the neighbourhood. Mr. Markham is quite enthusiastic in his description of their charms; and when speaking of the poem composed in honour of these trees in 1726 by La Fontaine, at the request of the Duchesse de Buillon, who had been cured of a dangerous fever by the bark, he remarks, that he could not expatiate also upon the exquisite beauty of the leaves and the delicious fragrance of the flowers, for they were not at that time known in Europe.

The Chinchona forests cover a tract of country equal to the length of Europe from the White Sea to the Mediterranean; and with such invaluable qualities to induce the preservation of the trees, it may appear strange that a necessity should ever have arisen for carrying the Chinchonas to new homes, separated from the Andes by half the circumference of the globe. But the recklessness of the Spaniards has not been exhibited with greater wantonness in any other sphere of colonial action than in their treatment of the bark-forest. They have evidently thought, and acted upon the belief, that the supply could never come to an end; and during above two centuries and a half that the bark has been collected, there is but one single instance of cultivation known; and in that case one solitary tree only has been planted, to replace those which have been destroyed at the rate of 25,000 a year in one limited district alone of the bark region. The consequence of this has been that it is now necessary to travel many days' journey into the forests before a single tree can be found, even in the heart of what used formerly to be the head-quarters of the collecting districts. Not only are the bark-gatherers too careless to replace by new ones the trees they destroy, but they are sometimes too indifferent even to turn a tree over, to separate the bark from the side upon which it has fallen. In consequence of this, whole districts now furnish scarcely any bark from which large quantities used formerly to be obtained; and the most serious apprehensions have long been felt by those who have been aware of the facts and have taken an interest in the matter.

Many attempts have accordingly been made to collect and transplant this valuable tree, but the Fates appeared to have conspired against them; for at one time fire, and at another, water; now a casual river-wave, and now an Atlantic storm; now drought, and now excess of moisture; and lastly, robbery and murder, have all played their part in rending the efforts fruitless to accomplish this great purpose. In 1743, La Condamine, an eminent French botanist, obtained some young plants from Loxa to be taken down the Amazons to Cayenne; but a wave washed over his little vessel near the mouth of the tributary river Para, and carried off the box in which he had preserved his plants for more than eight months. "Thus," he says, "I lost them, after all the care I had taken during a voyage of nearly 4000 miles." In 1739, Jussieu, another most eminent French botanist, travelled on foot through a great part of the Andes, and after fifteen years' laborious work made a large collection of plants, which he conveyed to Buenos Ayres. But here his servant stole the boxes containing them, under the belief that they contained money. Poor Jussieu took the loss deeply to heart, and returned to France, deprived of reason, after thirty-four years of wandering. His name, however, is still associated with the sphere of his labours; for Weddell has named one of the species *C. Josephiana* in honour of this eminent and unfortunate naturalist. In 1778, Ruiz and Pavon were sent out by the Spanish Government, and made a large collection of plants, and sent them off in fifty-three boxes, which were all

lost by shipwreck in a storm when off the coast of Portugal, and, as it were, in the very haven of their desires. They returned therefore in 1785 and obtained another large collection; when a fire broke out in the house, and destroyed the whole result of their labours. In 1770 Caldas, a native of New Granada, explored this bark district, and obtained much valuable information; but his end was untimely, for he was shot in 1806 by the brutal Moretto, who massacred above 600 of the most distinguished men of the country, in the wars of independence of the Spanish colonies.

At length, in 1848, fortune seemed to smile upon the perseverance shown in this cause; and Weddell brought some seeds in safety to Paris, where they were raised in the Jardin des Plantes, and some of the plants were sent to the Horticultural Society of London, where one of them flowered; many others were given away, and some were sent by the Dutch Government to Java. In 1852, at Dr. Royle's request, H.M. Consuls were desired to obtain seeds and plants in America, and Mr. Cope, the Consul-General of Ecuador, sent home some plants, but misfortune was not yet weary, for they all died on their arrival in England in 1855; and although at the same time some plants raised in the Edinburgh and Kew Gardens were taken in safety to Calcutta by Mr. Fortune, they all died during their removal to Darjeeling; and the seeds which were sent at the same time, never germinated. In 1853, the Dutch Government sent out a distinguished botanist, M. Hasskarl, from Holland, to collect plants and seeds in Peru, and he succeeded in collecting some ripe seeds in the forests of Tarma; but it has since been found that the trees in the region are worthless, as the bark contains neither quinine nor any other medicinal alkaloid. He did indeed obtain 400 good plants from a native agent, which he sent across the Pacific to Java; but of the whole 400 plants two only survived the voyage. In 1859, Mr. Markham was sent out by our own Government, and he succeeded in sending home 456 plants of the most valuable species of Chinchona, which reached England in health. A few were left in the Kew Gardens for safety, and the rest were sent overland to India in Wardian cases, where they arrived in October, 1860. But the heat in the Red Sea had been intense, and there was a detention of a week in Bombay, which produced a fatal rot in their roots; and although the leaves looked green and healthy on reaching India, nearly the whole died soon after their arrival. Several hundred cuttings were however taken from the plants which still seemed fresh, but they all failed to strike. With one more catastrophe we close our chapter of accidents. Half a mule-load of valuable young plants from another district of America (Huanuco) left Lima for England about the same time, and arrived here in perfect safety; but they were all dead on their arrival in India.

Thus it seemed as if an insuperable fatality opposed all attempts to transport this tender and valuable tree into India, where its presence would not only be a boon to the Government as regards the health of the army, but would prove also an incalculable benefit to the poorer native inhabitants, who suffer from fever as well as ourselves, and are quite unable to purchase quinine, from its costly nature. But though disappointment had hitherto attended all efforts to accomplish the object, despair was not the result. Many valuable lessons had been learnt from previous failures; and when the Secretary of State for India selected Mr. Markham, he chose a man who was already acquainted by personal experience with the Chinchona forests, who had learnt the lessons from the failures of others, and who was so happy as to obtain fellow-labourers in Mr. Spruce, Mr. Weir, Mr. Pritchett, and Mr. Cross, who devoted themselves heart and soul to the work; and it will now be our more agreeable task to narrate the steps by which success was eventually achieved, and to justify the remarks we made at the commencement of this lecture.

Mr. Markham's Proceedings in Collecting *C. Calisaya*.—In collecting and conveying the Chinchona plants, many dangers had to be encountered, and difficulties overcome. The trees grow in the depths of the forests, through which no tracks exist, and on the edges of ravines where a single false step is liable to prove fatal to the bearer or his load. The plants themselves, accustomed only to a warm damp situation, had to be transported over ranges of the Andes covered with snow to the port of shipment; and when there, and on their voyage, they were at a level many thousand feet below their natural habitat, and had to endure a tropical temperature instead of that only of an English summer. And, independently of the mere difficulty of finding

plants fit for removal, the American Governments and their agents threw every obstacle in the way of their removal; and fine and imprisonment are the penalties awarded to any one, native or foreigner, who shall export any of these precious inhabitants of the soil. But these points will all be more fully illustrated in following Mr. Markham and his coadjutors through their arduous and successful undertaking.

In anticipation of these difficulties, Mr. Markham arranged to go to the yellow-bark district of Caravaya himself, taking Mr. Weir as his assistant. He dispatched Mr. Spruce, an accomplished botanist with great experience of the wilds of South America, to the red-bark regions of Chimborazo, having Mr. Cross for his assistant, with instructions to obtain seeds from the valuable grey bark from Loxa; and Mr. Pritchett was sent to the Peruvian district of Huanuco, which also yields valuable grey barks. By these arrangements, he hoped to obtain all the species of Chinchona which possess medicinal value, except those from New Granada and these he was fortunate enough to receive from Java in exchange for other species. In employing so many agents and in such varied places, the chances of success were increased; for with one collector alone "in such wild unfrequented regions, all is uncertainty; for along the dizzy path of the Andes a single false step may dash the fairest hopes, and disappoint the most careful calculations."

In December, 1859, he sailed from England and crossed the Isthmus of Panama *en route* for Lima, whilst he sent thirty very large Wardian cases * round Cape Horn, to be in readiness for the various collections, as soon as they should be brought to the coast.

After travelling through varied and magnificent scenery in the gradual ascent of the Andes, Mr. Markham arrived about the end of March at Apo (14,350 feet), tired, drenched, and cold; the roof of the post-house so badly tiled, and the doors so roughly fitted that it was impossible to close them. Both man and beast are here subject to a most distressing illness, called *sorochi* by the Peruvians, caused by the rarefaction of the air at these great altitudes; and as he was suffering from a sharp attack of illness before his arrival here, he was affected with the violent pressure on the head and neck with more than the usual severity, so that when he recommenced his journey at 3 A.M. the next morning, he was unable to mount his mule without assistance. In this condition he had to travel through a storm of hail and snow; until after several weary hours, which extended into the darkness of night, they arrived at the highest part of the road, 15,000 feet above the level of the sea. From this point he descended to Puno, whence he proceeded to the Chinchona forests of Caravaya. At Sandia he procured four Indians and two mules, and laid in a stock of provisions to last for a month; for beyond this point there was no chance of obtaining supplies, and the danger arising from failure of provisions in these forests is not slight. Dr. Weddell, whilst ascending the mountains, fell in with the hut of a bark-collector, the owner of which was stretched in the agonies of death nearly naked, and covered with myriads of insects, whose stings had hastened his end. His face was so swollen as to be unrecognizable, and his limbs were in a frightful state. Such is the end to which their hazardous occupation exposes the bark-collectors,—death in the midst of the forests, without help and without consolation. But the uninhabited parts of the forests are not always the most dangerous. A young Englishman, named George Backhouse, went into the forest to collect bark in 1851, accompanied by Colonel Bologenesi and a party of Indians; they fell in with some of the Chunchos, natives of the forests, who engaged at first to assist them in return for knives and other presents; but shortly after refused to work, when a quarrel ensued, which ended in the massacre of poor young Backhouse and nearly all his party.

A melancholy fate like this did not however befall Mr. Markham; but his expedition was now in great danger of failing in consequence of his meeting with a certain Colonel Don Manuel Martel, who, being a staunch conservative and protectionist, and surmising the object of his journey, was determined to prevent his country from being ruined by the cultivation elsewhere of its native produce. He accordingly spread abroad the report of Mr. Markham's nefarious intentions, and the latter was therefore

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* Each case was 10 feet 10 inches long, 3 feet 3 inches broad, and 3 feet 2 inches high and weighed with the soil and plants rather more than three hundredweight.

obliged to make his arrangements with the utmost dispatch, and enter the forest with less preparation than he would otherwise have wished.

After a time, they had penetrated so far that the road was unknown to his Indian guides, and entirely grown up, as it had never been travelled since the bark trade of that part of the country had come to an end, fifteen years previously. They had therefore to force and cut their way for many hours with great difficulty through forest and jungle so dense, that it was often nearly dark at midday, until at length they came upon the bank of a river which afforded easier passage. Through similar difficulties they continued their journey till they came to a little hut, the last inhabited place known in this region, and here they had but six days' provisions left; the owner of the hut being little better off then themselves, and living upon roots and frozen potatoes. Beyond this point there has never been a road at all, and they had to cut their way as best they might, with the Tambopata boiling and surging at intervals over the rocks below them, rendering it necessary for them to cross the chasm here and there on the fallen stems of tree-ferns rotting from age. They were now in the heart of the Chinchona district, and as the trees were most abundant on the side of the river opposite that on which they had encamped, Mr. Markham was extremely anxious to cross it. It came on to rain however so heavily in the night, and the water rose so much, as to occasion fear lest they should have been overwhelmed in their tents. The next day, by stripping and using a long pole to steady himself, Mr. Markham tried to ford the river, but was obliged to give up the attempt, after being as nearly as possible twice carried away by the force of the stream. Here, however, they found a number of young saplings, which they uprooted, and carefully packed in moss, their operations being retarded by the maddening pain from venomous insects, and especially from a species of fly, which in a moment raised swellings and blood-red lumps all over the hands and face. In continuing their search, the whole way was along giddy precipices seeming to hang halfway between the sky and the roaring torrent, with no foothold but decaying leaves, and nothing to grasp but rotten branches. After a hard day's work, they had only collected fourteen plants fit for removal; and when they returned to their tent, dead-beat with fatigue, it was only to find the Indians in a state of mutiny, and determined upon returning home, as they had neither maize nor coca left. As it would have been impossible to carry the plants back if the Indians had deserted him, Mr. Markham dispatched the most trusty of his party to the hut they had left a few days previously for fresh supplies if possible; and, after his departure informed them in the best native dialect he could command, that they were thieves, liars, traitors, and children of a certain old gentleman, who would undoubtedly soon punish them if they went back, whilst he (Mr. Markham) would reward them well if they remained faithful. This forcible expression of his opinion produced a good effect; and a friendly evening closed the mutinous and alarming day.

Next day disappointment still prevailed, for only worthless chinchonas could be found, the good ones having long been exterminated; and again he returned to his tent, stung with hornets, hands sliced in pieces by the sharp-cutting edges of the leaves of a plant called Challi challi, and with only three plants of valuable chinchonas.

Mr. Markham now again made the attempt to cross the river, which had been gradually subsiding for some days; and supporting himself by the stem of a young palm, he waded up as far as the middle of the stream; but here the stones slipped from under his feet, the water, which rushed down with great velocity, came nearly to his arms, and it was with the utmost difficulty that he retained his hold. At length, however, he gained a firm footing, and eventually crossed the river, and was rewarded by finding a good supply of healthy *C. Calisaya* plants, of which he secured above a hundred. After some further stay he obtained above four hundred fine, healthy young plants, which were carefully placed in layers by Mr. Weir, with plenty of moss between them, ready to be sewn up in matting, and transported across the snowy summit of the Cordilleras for shipment at the coast.

But now fresh difficulties commenced; for his host informed him that he had received an order from the Alcalde of Quito, ordering him to arrest Mr. Markham and his party, and prevent a single plant from being removed. As however he was alone, there was a difficulty in the way of arresting a party of six men; and Mr. Markham kept constant watch over his precious plants, and so prevented their destruction; at

the same time telling his host that his (the host's) views of the matter were entirely incorrect, and he (Mr. Markham) should defend his own property until he had taken it safely away. This he did in the morning; but after travelling some hours they met the sturdy protectionist Martel, evidently waiting for them; but as they presented him with the view of a revolver—albeit the powder was damp, though he was not aware of this fact—he became very civil, and allowed them to pass without molestation. It was soon evident, however, that the country had been raised in opposition, and that Martel had only withdrawn his forces to plant them in a more favourable position for conflict. So Mr. Markham divided his company, and sent Mr. Weir and Pablo on the highway, where Martel was likely to meet them, with the mules and the baggage of no value, but without the precious Chinchonas; whilst he himself, by a timely bribe, procured other mules to carry the plants, and went over waste and untrodden parts of the mountains, so as to avoid all places of resort, and towns or villages on the way. Here he nearly lost a large portion of his treasures, for, in skirting along the edge of a precipice, the cargo-mule fell headlong down it, and was intercepted far below by the trees and brushwood. They could see its legs kicking in the air, but it was some hours before a circuitous path could be cut, so as to extricate her, and bring her up again in safety. But though free from pursuit along these trackless parts, the difficulties were increased. On pitching for the night, with the cold intense, Mr. Markham found that his bag of food and lucifer-matches had been stolen at Sandia, the last place at which he had stopped; and after being ten hours in the saddle, and faint from hunger, they had to go supperless to bed, with the cold penetrating to the very marrow. It is impossible to restrain one's feeling of admiration, after this description, on reading casually a page or two further on:—"Every night I had wrapped the Russian mats which enveloped the plants in warm ponchos, and the tent." Such loving and faithful care of his valuable charge deserved the success which he achieved; for he had the satisfaction of avoiding all hindrances on the way, and bringing the young plants in safety to the port of Islay, where they were deposited in the Wardian cases, and soon showed that they had recovered from the risks of their exposure in crossing the frozen Cordilleras, by putting out buds and young leaves. But further trials of his patience were still in store for him; the superintendent of the Custom House said it was illegal to export chinchona plants, and refused to let them go, until, with great difficulty, Mr. Markham obtained an order from the Minister of Finance at Lima permitting it. One further risk, and they were safely at sea. On the night previous to sailing an attempt was made to bribe the man in charge of the cases to bore holes in them, and kill the young plants by pouring boiling water upon them, but happily without success; and the next day they set sail for Panama, to cross the Isthmus there, and thence to be conveyed by sea to England, where they arrived in health in August, 1860. They were immediately sent by the overland route to India, and the result has been already mentioned. After escaping from political perils and the dangers of the road, after surviving the icy region of the summits of the Andes, the heat of the Pacific, and the changes of conveyance connected with the Isthmus of Panama, they fell victims to the heat of the Red Sea, and the detention at Bombay; and the plants, whose varied fortunes we have thus followed, were fatally affected with rot on their arrival in India, and died on reaching the Nielgherry Hills, the place of their ultimate destination.

Mr. Spruce and Mr. Cross's Proceedings in Collecting Red and Grey Barks, and their Introduction into India.—Whilst Mr. Markham was engaged in collecting the Yellow Bark, *C. Calisaya*, in Caravaya, Mr. Spruce was occupied in obtaining the Red Bark, *C. succirubra*, in the mountain slopes of Chimborazo, where he experienced difficulties and dangers in most respects similar to those just described, but with one important difference. In Peru and Bolivia the forests have no established owners, but in Ecuador they are all the private property of individuals, and from them Mr. Spruce, after considerable negotiations, purchased permission to collect as many plants as he liked, on condition that he did not touch the bark of any standing trees. A severe rheumatic and nervous attack, almost amounting to paralysis, obliged him to depute the duty assigned to him to Dr. Taylor; but at the last moment he determined upon undertaking it himself, and carried it through successfully, though he was suffering severely from illness all the time, and his headquarters,

during the whole period of his work in the forests, was the upper-story of a sugar-cane mill, to which he climbed each night, by means of notches cut in the sides of the trunk of a tree. The floor and walls were made of rough plants, which nowhere touched each other, so that the place was full of fog, causing aching limbs and mouldy clothes. "Though upheld," as he says, "by a determination to execute, to the best of my ability, the task I had undertaken, I was but too often in that state of prostration, when to lie down quietly and die would have seemed a relief." A few examples will illustrate what that task involved to a man in this condition. On reaching the Pumachaca river, he found that the ford had been destroyed by the falling of a cliff, and that in its place a deep whirlpool had been formed. He therefore collected the driftwood on the banks, and made a bridge over the narrowest part of the river, which supported himself and his party in crossing, whilst the horses swam across with great difficulty; after which it was necessary to roll down stones and earth so as to make an incline on the brink of the river, up which they could ascend to the summit of the bank.

On a subsequent journey to Loxa for the purpose of procuring the Crown Bark, Mr. Cross had to pass through dense swampy forests, over precipitous ridges of the Andes, and in crossing one of these his mule slipped down a deep ravine, and was dashed to pieces. Indeed, the situation of many of the trees is so difficult of access, that Mr. Cross had frequently to descend into the ravines, where he saw them growing by means of the trailing stems of forest species of Passion Flowers.

The excessive moisture of the Bark region could scarcely be more convincingly shown than by the fact that the seed-vessels of some of the flowers were covered with lichens even before the petals of others had fallen off.

Mr. Spruce was so fortunate as to find the seeds ripening rapidly, and an Indian being sent up the trees, broke off the panicles very carefully, and threw them down to the ground upon sheets spread underneath to catch any loose seeds. They were then spread out in the sun, where those which were not quite mature when gathered quickly ripened, and by this means he obtained above 100,000 ripe seeds of the most valuable species of chinchona. In the intervals of seed-gathering Mr. Spruce was employed in making cuttings and layers for the most healthy young trees; and, with the valuable assistance of Mr. Cross, who had the principal charge of this department, above six hundred of them rooted, and were safely established in Wardian cases, and arrived in this country in perfect health.

The collection of chinchona plants by the Dutch in a previous year, and now by Mr. Markham and Mr. Spruce, excited the feelings of the natives, and caused the various legislatures to enact laws by which a heavy fine, and other penalties, were imposed on all who were engaged in removing plants or seeds; but fortunately red tape is not confined to England; and before the 1st of May, 1861, when these acts were passed, both seeds and plants were growing in undisturbed safety on the Nielgherry Hills in India, to which we shall now accompany them.

The great difficulty in connection with Indian cultivation was to find a situation in which nine months' rain, or thereabouts, could be obtained, along with an altitude of several thousand feet within the tropics. There were plenty of places where the latitude and the elevation of the mountains were suitable enough, but they have rain for a few months only, and perfect drought during the rest of the year, whilst the chinchonas require moisture as well as a moderate heat even during the dry season. At length Mr. Markham fixed upon the Nielgherry Hills, just above the Government station of Ootacamund, as a situation which combined all these requisites. They are between 11° and 12° degrees of latitude distant from the Equator, and rise to a height of above 8000* feet above the level of the sea; whilst their peculiar isolated situation near the tapering extremity of Hindostan causes them to receive both the south-west monsoon from May to September, five months, and also the north-east monsoon from October to March, five months, so that they enjoy nearly nine months of rain in the year.

In this situation, therefore, the first plantations of chinchona have been fixed; and

* Dodabetta, the highest peak, is 8600 feet above the level of the sea, and Ootacamund is 7300 feet above the sea-level.

warned by previous sad experience, the plants this time were sent out in spring, during a cold season of the year in the Red Sea, instead of in summer as on the former occasion, when the heat proved fatal to them all. Both plants and seeds this time arrived in perfect safety; and, under the able management of Mr. M'Ivor, the superintendent of the Government gardens at Ootacamund, thousands of young plants have been propagated from the seeds and from cuttings, and in August of last year nearly 100,000 healthy plants were rooted, of which a considerable proportion were planted out permanently, and another large proportion was in the hardening-off frames in the open air.

The conditions of light and air most favourable to the growth of the chinchonas have been a subject of most anxious and careful consideration; and the personal experience gained by Mr. Markham, and the other botanists whose labours we have just recorded, has been of the utmost importance, because it is in many essential particulars opposed to the plans adopted by the Dutch in the chinchona plantations in Java, where the superintendents have not had the benefit of personal acquaintance with the native forests of America. The testimony of all these successful collectors is uniform in showing that the most healthy and vigorous chinchona-trees which they found in the American forests, were those which grew in open situations, where they were not overshadowed by other trees. "The trees appear to pant for air and light," is the forcible expression of one of them, in describing the condition of some which were in the dense forest, where they were so overtopped by other trees that they ran up spindly and weak, never bearing flowers or ripening seeds. Everywhere chinchonas run up until they have surpassed the trees in the neighbourhood, and then they throw out their branches, and develop their most luxuriant leaves; and when we bear in mind how essential the action of the leaves is to the development of the wood, and the peculiar secretions in barks generally, and how important a stage in the vigorous activity of a plant the period of flowering forms, we should think it probable beforehand that pure air and light would contribute most efficiently to the healthy growth of these trees.

They are, however, sensitive and delicate plants, and in their early stage require a moderate shade to protect them from the too powerful glare of a tropical sun; and the method which has therefore been successfully adopted thus far in the Nielgherry plantations has been to plant them in a loose, porous soil, which shall not retain too much moisture; to give them at first from 60° in the morning to 75° in the day; to let them have plenty of light and air, with just the precaution above-mentioned; and to reduce the temperature a few degrees as they become larger and stronger plants. Under this treatment they become clothed with large, healthy leaves, of a beautiful bright green colour; the plants are as broad as long, and the bark acquires an extraordinary thickness, being in the smaller branches even thicker than the wood itself. Now this is a point of great practical importance, for experience has long since proved that the proportion of alkaloids is greater in thick than in thin bark; and that bark grown upon a high level yields a larger percentage of quinine than bark from similar trees grown at a lower elevation. All these things therefore point to the importance of free air and plenty of light as soon as the plants are capable of bearing such exposure.

The negative results obtained by the Dutch in Java, where an opposite system has hitherto been pursued, also point in the same direction. The young trees from their nurseries are planted out in prepared places, under the shade of forest trees purposely left standing, and they soon run up to be tall, slender, and unbranching, with a very small percentage of quinine in the bark; and whilst the chinchonas, under the system adopted at our plantations, had increased in less than two years to above 70,000, the Dutch in six years had only increased theirs to 7000 plants.

The Prospects of a Remunerative Cultivation of Chinchona and the Requisite Conditions.—It is essential that the cultivation of Chinchona should pay, or it will be impossible to extend it beyond the limits of Government influence. It is therefore a question of great importance, whether it is probable that it will be remunerative, and what circumstances are most likely to render it so.

Experience thus far has proved that the young plants acquire a degree of strength which enables them to bear free exposure to light and air in a period under two years,

and therefore expensive nursery-arrangements are not requisite after this age. It is also fairly established that a moderate degree of shade, such as may easily be obtained by cheap nursery-management, is sufficient, even during this early period of their growth; and that at the end of three or four years the plants have attained a height of a few feet, are nearly as broad as long, and possess a bark which in some instances has been even thicker than the woody portion of the stem. Now although the percentage of alkaloids is greater in old bark taken from large trunks or branches than in the younger bark taken from small shoots and twigs, yet even this contains a sufficient amount of alkaloids to pay well for its extraction. In short, the bark from branches three or four years old commands a remunerative price in the market. It is further ascertained that the thicker the bark the greater is the percentage of alkaloids, and the larger and more luxuriant the leaves the thicker is the bark produced. There is therefore every reason to believe that by adopting the system so successfully practised hitherto in the gardens at Ootacamund, the cultivation of Chinchona will become so profitable, as to ensure its extension amongst the coffee plantations and other places where the requisite degree of moisture and altitude can be obtained. At four years of age the shrubs may be cut down; and if the roots are left in the ground fresh shoots are quickly produced, which will be ready for cutting down in four years more; and thus a paying crop of bark may be obtained every four years. But it is probable that a somewhat different plan will really be adopted, and that instead of cutting the plant down entirely, only the largest branches will be pruned off. From the axils of these branches, buds are quickly developed into fresh twigs; and next year a further selection of well-grown branches may be removed, to be replaced by a fresh crop of buds and twigs; and in this manner an annual crop of bark may be obtained, without even a temporary destruction of the plants, which will sustain little injury from a judicious pruning in a climate where vegetation is so rapid that the buds will develope almost immediately after the removal of the branches. It is also probable that a large amount of bark will be used in the country itself in the green state; for the alkaloids are not dependent upon the dryness of the bark for their formation; and there is abundant experience to prove that the green bark is equally efficacious as a febrifuge with the dry; and it will therefore be an invaluable blessing to the natives of India, if they can have within the limits of their own gardens or coffee plantations a shrub which shall merely require boiling to yield them the health-restoring qualities of quinine and chinchonine; the value of which they know and appreciate, but the cost of which places it at present beyond their power to obtain it. It may be said therefore that the future presents a most encouraging prospect as respects the cultivation of the Chinchona, not only by Government, but by persons independent of Government assistance.

The paper was illustrated by numerous drawings and specimens, and was listened to with much interest, the lecturer being frequently applauded in the course of his remarks. At the conclusion a cordial vote of thanks was awarded Dr. Nevins, and the meeting then separated.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Second Ordinary Meeting of this Society was held at the Town Hall, on Tuesday evening, the 5th of May; S. Parr, Esq., President, in the Chair.

The Minutes of the last meeting having been read and confirmed, Mr. J. H. Atherton (the Hon. Sec.) announced the following donations to the Library:—

Thomson's 'Elements of Chemistry.' From Rev. E. H. Vernon.
'Chemical Notes and Memoirs.' From Henry Cheetham, Esq.
Brande's 'Chemistry.' From Dr. Tatham.
'Pharmaceutical Journal.' From Pharmaceutical Society.
Parr's 'Chemistry of Soils.' From the President.
An Annual Subscription of Half-a-Guinea. From E. Harvey, Esq.

The following gentlemen were elected Honorary and Corresponding Members:—

E. J. Lowe, Esq., F.R.S.A., Highfield.
W. E. Heathfield, Esq., F.R.G.S.

The Secretary stated that arrangements had been made for the delivery of a short

Course of Lectures on "Materia Medica," commencing in October, particulars of which would be announced at an early period.

W. P. Stiff, Esq., M.B., read an interesting and valuable paper on the "Metrical System of Weights and Measures," in which he described forcibly and clearly the advantages to be gained by the adoption of this system, referring also to the recent important discussions relative to the adoption of a uniform standard of weights and measures to be introduced into the forthcoming British Pharmacopœia, and regretting that the Pharmacopœia Committee had decided not to adopt this system, which would prove so invaluable to all classes.

After a few remarks from the President, Dr. Tatham, Mr. Atherton, and Mr. Lewis, the following Resolution was carried :—"That this Society cordially approves of the 'Metrical System of Weights and Measures,' and would recommend the adoption in the new Pharmacopœia of corresponding tables to each preparation, showing the relative weight of this and the old system, preparatory to its general adoption at some early future period."

Mr. R. J. Bearcroft read an interesting paper on "Opium and its Preparations," in which the history of opium was traced, the various kinds enumerated, with special attention to the estimation of purity and strength by the amount of its active principles.

A cordial vote of thanks was accorded to Dr. Stiff and Mr. Bearcroft for their interesting papers.

The thanks of the meeting were also given to the donors to the Library.

The President announced that the next meeting would be held in October, as the Society would not meet during the summer months.

ORIGINAL AND EXTRACTED ARTICLES.

NOTE ON THE ORDEAL BEAN OF CALABAR.

(*PHYSOSTIGMA VENENOSUM*, Balf.)

BY DANIEL HANBURY, F.L.S.

The recent experiments of Drs. Argyll Robertson, Fraser, Stewart, Messrs. Bowman, Wells, and others on the Ordeal Bean of Calabar* and the fact elicited by these experiments that it possesses the peculiar power of causing the sphincter pupillæ and ciliary muscle to contract, render it probable that this remarkable seed will find a useful application in ophthalmic medicine; and the present moment is therefore appropriate for reviewing some of the facts hitherto ascertained respecting it.

The first important notice on the subject is contained in a most interesting and valuable paper by Dr. Christison read before the Royal Society of Edinburgh 5 February 1855. In this paper the author after alluding to various vegetable substances used by the natives of tropical Western Africa in ordeal by poison, describes as one of pre-eminent virulence, a large leguminous seed called *Eséré* used by the negroes of Old Calabar in the Gulf of Guinea. This seed which Dr. Christison called the *Ordeal Bean of Old Calabar*, and the botanical origin of which was at that time unknown, was the subject of some remarkable toxicological experiments which amply proved it to possess powers of no ordinary character. Dr. Christison also made some experiments on the seed with the view of isolating its active proximate principle, but was unsuccessful, partly owing it is probable, to the limited amount of material at his disposal. "All I can say" he observes, "is that the seed like others of its natural order, contains much inert starch and legumin, and 1·3 per cent. of fixed

* *Edinburgh Medical Journ.* March 1863; *Medical Times and Gazette*, 16 May, 1863.

oil, also probably inert; that its active properties may be concentrated in an alcoholic extract, which constitutes 2·7 per cent. of the seed; and that this extract does not yield a vegetable alkaloid by the more simple of the ordinary methods of analysis."*

Some of the Ordeal Beans in Dr. Christison's possession having been placed in earth, germinated in the Botanic Garden of Edinburgh, and in the garden of Professor Syme, producing vigorous plants; but as these did not flower, no determination of the genus to which the plant belonged could be made. At length, about the year 1859, the Rev. W. C. Thomson of Old Calabar, a good botanical observer, was so fortunate as to obtain after many trials, complete and excellent specimens of the plant, some of which, preserved in fluid, were communicated to Mr. Andrew Murray and Professor Balfour. Their examination devolved chiefly on the latter gentleman, who on the 16 January, 1860, read before the Royal Society of Edinburgh a *Description of the Plant which produces the Ordeal Bean of Calabar*, which, illustrated by two plates, was subsequently published in the Society's *Transactions*.†

The Ordeal Bean belongs to the natural order *Leguminosæ*, the sub-order *Papilionaceæ* and tribe *Phaseoleæ;* but subordinate to this, its characters have been considered sufficiently peculiar to warrant the formation of a special genus for its reception. This has accordingly been done, the new genus receiving from Dr. Balfour the name of *Physostigma*,‡ and the one species which it contains, that of *venenosum*.

The most remarkable character of the genus *Physotigma* is that derived from the stigma, which possesses a singular, crescent-shaped, hooded appendage. By this character and the long grooved hilum of the seed, it is separated from the nearly allied genus *Phaseolus;* and from *Mucura*, to which its seed bears considerable resemblance, by the characters of its flowers and pod; from *Canavalia* by its diadelphous stamens and other characters; and from *Lablab*, by its phaseoloid carina and pistil.

Physostigma venenosum, the Ordeal Bean, is a large climbing perennial with a woody stem of two inches diameter and sometimes fifty feet in length. Its large leaves are pinnately trifoliolate, with ovate acuminate leaflets. Its papilionaceous flowers are in pendulous racemes, the stalk or rachis of which is covered with tuber-like knots; each flower is about an inch in length and of a pale-pink or purplish colour, beautifully veined. The legume when full-grown is about seven inches in length, elliptico-oblong with a short curved point stipitate, dehiscent and containing two or three seeds. The seeds which are oblong or somewhat reniform, are from 1 to $1\frac{3}{8}$ inches in length by about $\frac{3}{4}$ of an inch in breadth; their convex edge marked by a long sulcate hilum, extending as a deep furrow from one extremity of the seed to beyond the other. The exterior of the seed is somewhat rough with a dull polish; its colour is a deep chocolate-brown, somewhat lighter on the raised edges of the furrow. The seeds weigh, on an average of twenty, 67 grains.

The Ordeal Bean is difficult to obtain even near the localities where it is pro-

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* *Pharm. Journ.* Vol. xiv. (1855), p. 472. † Vol. xxii. p. 305.

‡ From *φυσάειν to inflate*, and *στιγμα*. The genus is thus defined.—Calyx campanulatus, apice quadrifidus, laciniis brevibus, lacinia suprema bifida. Corolla crescentiformis, papilionacea; vexillum recurvum, apice bilobatum, basi angustatum, margine utroque auriculatum, membranâ inflexâ auctum, medio longitudinaliter bicallosum; alæ obovato-oblongæ, liberæ, supra carinam conniventes, versus basin appendiculatæ. Discus vaginifer. Ovarium stipitatum, 2–3-ovulatum. Stylus cum carina tortus, infra stigma subtus barbatus; stigma obtusum, cucullo cavo oblique tectum. Legumen dehiscens, oligospermum, elliptico-oblongum, subcompressum, extus rugosum, endocarpium intus telâ laxâ cellulari tectum, isthmis cellulosis inter semina. Semina strophiolata, hemisphærico-oblonga, hilo late-sulcato semicincta.

Herbæ suffruticosæ volubiles in Africa occidentali tropica crescentes: foliis pinnatim-trifoliolatis, stipellatis, floribus nodoso-racemosis, purpureis.

duced. Dr. Christison states upon the authority of the Rev. H. M. Waddell of Old Calabar, that "the plant is everywhere destroyed by order of the king, except when it is preserved for supplying the wants of justice,—and that the only store of seeds is in the king's custody." Whether this remains to be the fact, I know not; but Mr. Gustav Mann, Collector to the Royal Gardens, Kew, to whom I wrote some time ago requesting a supply of the beans, remarked in a letter under date Nov. 24, 1861, that he had been able to procure but few, "as the people do not like to give them to Europeans." There is no reason, however, to suppose that this reluctance will continue if a good money-value become attached to them.

The best form in which to employ the Ordeal Bean as a medicine is a point of importance to the pharmaceutist, but one upon which further experience is required. Dr. Christison found that the active matter of the bean could be separated by alcohol, and he obtained (as already stated) 2·7 per cent. of extract by this menstruum. I found that upon reducing the bean to coarse powder and exhausting it with cold alcohol (sp. gr. ·838), 2·3 per cent. of dry extract was obtained; and upon further exhausting the residue with similar alcohol at a boiling temperature, a further product of extract amounting to 2·2 per cent. Whether these extracts are alike in power is at present hardly proved, but the result of a single experiment appears to show that the second is as powerful as the first. The alcoholic extract rubbed down with water, forms a turbid liquid, which however efficient, is certainly not an elegant preparation, and it has been said rapidly to spoil. It has been prepared of several strengths, so that one minim may represent ½, 1, 2, or 4 grains of the bean. In glycerine, the alcoholic extract dissolves freely, yielding a tolerably clear solution; and if this menstruum be unobjectionable as an application to the eye, it will certainly prove convenient pharmaceutically, as it affords a solution not liable to change by keeping.

The residue of the bean, after the extract had been obtained as above described, was dried; and with the view of ascertaining whether it still contained a poisonous principle, some of it, mixed with bread and lard, was administered to a mouse and rat. Neither animal would eat the mixture very readily; the mouse after some hours ate a pellet containing five grains of the residue and died in the course of the next day. To the rat, which at intervals ate a much larger quantity, the residue also proved fatal in about forty hours. These experiments show that the bean had not been entirely deprived of its active properties.

CINCHONINE—ITS VALUE IN MEDICINE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

I notice in the May 'Pharmaceutical Journal' a letter of Dr. Daniell's, from Kingston, Jamaica, stating that his experience in the treatment of febrile diseases was unfavourable to cinchonine, in consequence of the cerebral disturbance which it occasioned. It is remarkable that these results of West Indian experience should be so entirely opposed to those obtained in practice in the East Indies, as treasured up by Dr. Macpherson, Presidency-Surgeon, whose work on Quinine and Antiperiodics (published at Calcutta in 1856) is by far the most original and valuable that has fallen under my notice in the English language.* Dr. M. states that cinchonine has been found, after numerous experiments on animals, and long observation on man, to produce in

* By referring to Dr. W. F. Daniell's remarks published in the last Journal, it will be seen that his remarks refer to the use of Cinchonine in Western Africa, and not in the West Indies, as here stated.—Ed. Ph. Journ.

its state of sulphate *effects precisely analogous to those of quinine;* it causes the same cerebral disturbances and the same degrees of them, a period of excitement and of sedative action respectively; its contact with the digestive tube is neither more nor less irritating than that of quinine, only its power is less by about one-third; it is absolutely certain that cinchonine is as good a febrifuge as quinine; M. Forget has indeed reported unfavourably on cinchonine; but Dr. Hudellet, of Bourg, in 503 cases found no inferiority to quinine; this was the result in Holland with Basting and Pereira; and most authors consider cinchonine very little inferior; Dr. Macpherson therefore strongly urges the Government of India to substitute cinchonine for quinine.

Briquet's great work, the result of eleven years of continuous experiment and observation, bears similar testimony to the efficacy of cinchonine. He says that cinchonine produces nearly the same effects as quinine, with the exception of confusion of sight, of which he never saw a trace. He says that it results from his experiments that the power of sulphate of cinchonine is a third or a fourth weaker than that of bisulphate of quinine. This result, he observes, is in accordance with what has been observed by others, who have been obliged to give sixty to eighty centigrammes of cinchonine, with the addition of acid, to arrest fevers which would have been cut short with a dose of forty to fifty centigrammes of sulphate of quinine at the most. He thinks that nevertheless there would be advantage in employing cinchonine on economical grounds, and that there would be no inconvenience to the patients, because its local exciting effect and its bitterness are less than in the salts of quinine. (*Traité Thérapeutique du Quinquina*, pp. 991, 174, 468, Paris, 1853.)

It seems, however, that the question is not yet set at rest, and it is surely desirable that it should be pressed upon the attention of the medical world until some certain conclusion is universally adopted. It must not be forgotten that it was only after a long and severe struggle with prejudice that Peruvian bark, in any shape, was admitted in medicine.

My own experience in a large number of cases, treated gratuitously, has not presented any feature of marked difference in effect from the other alkaloids of bark. It certainly cures the agues of this country; but I do not pretend to speak minutely of its effects as distinguished from those of quinine. It is the more important to decide the question of the value of cinchonine, because several of the species of chinchona cultivated in India must be estimated as useful or worthless according to this criterion.

Yours, etc.,

JOHN ELIOT HOWARD.

PROVINCIAL PHARMACEUTICAL MEETINGS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I was much pleased to see Mr. Reynolds's letter in last month's Journal, adverting to the American Pharmaceutical Association, and proposing it, as in some respects a model which we might advantageously imitate. Many pharmaceutists up and down the country have long held similar views, and now that the subject has been broached, will, I doubt not, be ready to express themselves freely upon it. The suggestion to hold a preliminary meeting in Newcastle during the sittings of the British Association, is a good one, and I hope it will be carried into effect. On behalf of the pharmaceutists resident here I can only say that we shall be exceedingly glad to see our brethren from a distance, and will do all we can to facilitate the objects of the meeting.

Yours truly,

HENRY B. BRADY, *Local Secretary.*

40, *Mosley Street, Newcastle-upon-Tyne, May*, 1863.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Several years ago I endeavoured to make public an idea which appeared to merit careful consideration, namely, that for the best interests of the pharmacy of England it was expedient the annual meetings of the Pharmaceutical Society should be held not always in one fixed place, but in rotation at the various towns of importance where its members resided.

My new-born suggestion was received but coldly, and, probably from my own bad nursing, appeared to die ere it had well drawn breath. To my delight, however, I find after years of inanition my bantling restored to life and in the enjoyment of the careful nurture of one who, though owning my paternal rights, is likely to prove much more capable of paternal duty.

I cannot, however, even under such circumstances hesitate for one moment to acknowledge my own. What I then thought upon the subject of the peripatetic gatherings of our Society I have thought ever since, and am more than ever confirmed in my views by the present aspect of affairs.

Hitherto the Society has conducted the experiment of pharmaceutical progress upon exclusively centralization principles, and though I do not wish in the least to underrate the benefits which have resulted from its twenty years of labour, I think the position and prospects both of the Society and its experiment at the present moment not quite satisfactory.

In 1853, the London members numbered 414; last year they numbered 351,—a falling off equal to 15 per cent. The list of country members in 1853 amounted to 2041, last year to 1492,—a falling off equal to 27 per cent.

Moreover, the experience of the same period proves that as far as discussions upon scientific subjects at Bloomsbury Square are concerned, the interest taken in them by provincial members has greatly languished.

Various reasons may, no doubt, be advanced in explanation of these facts not quite so complimentary to the provincials as I for one think they deserve, but the staunchest Londoner would scarcely claim for himself and his 350 co-metropolitans the monopoly either of ability or inclination to share in the higher pursuits of the profession. On the contrary, among the 1500 country members, each one of us knows many quite capable of holding their own in any pharmaceutical company whatever, and, I believe, it is only the deficiency of proper opportunity that damps their enthusiasm and checks their utterances. Speaking from certain knowledge, I can state that several have for some time resolved to communicate nothing for discussion at the Society's meetings unless able to be present in person to defend their communications against the criticisms, candid and uncandid, to which they are sure to be subjected, and it must be remembered, attendance in person for one who lives 120 miles from Bloomsbury Square, is a tax upon his scientific enthusiasm, both in time and cash, of no small weight.

Hence the London members have done the largest share of the Society's work, and have clearly enjoyed the largest share of its benefits; and in the meantime scientific pharmacy, to say the best of it, does not flourish. Would it not then be wise to try a partial change of policy, to some extent at least to diffuse rather than concentrate the Society's powers, and test the stuff of which these 1500 countrymen are made upon something like an equal footing with their more favoured fellow-labourers?

Local societies appear to be the only means of perpetuating the interest of the provincial members of our body in the cultivation and progress of pharmacy, and these, in my opinion, of necessity require the assistance which would be afforded by the external stimulus of a periodic visitation from the leading men of the Society. Local associations are, I admit, at present not very numerous; but I doubt not, if it once became a law of the Pharmaceutical Society that its chief meeting for the year should be held in rotation at those

towns which could boast such an organization, they would speedily be seen to rise and flourish in goodly number.

Once more, then, I raise my voice for a partial diversion to other towns of the stream that has so long set in the direction of London, in the hope and expectation that such a change will prove a new impulse to progress, especially amongst that section of the Society which hitherto has not received its fair share of the advantages of an organization of which it has ever been the main support.

Having referred to Mr. Reynolds's communication of last month, I cannot refrain one word of thanks to its author for the vigour and skill with which he advocates both this old suggestion of mine and his own more enlarged ideas of scientific combination and pharmaceutical progress. I hope to see his propositions made the text of much careful discussion in the future columns of this Journal.

I am, Gentlemen, your obedient servant,

G. F. Schacht.

7, *Regent Place, Clifton.*

PROVINCIAL EXAMINATION FOR ASSOCIATES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The important privileges lately conferred by the Legislature upon pharmaceutical chemists by exemption from serving upon juries, together with many "signs of the times" in the increase of local associations not confined to the register of the Society, renders the letter of your correspondent "Opifex" peculiarly opportune and important. The question raised is how can we now extend our ranks without sacrificing our principle of qualification, and yet embrace many competent and deserving men scattered throughout the country, who are deterred by special circumstances, or by considerations of expense, or uncertainty from travelling to London, in order to pass the major examination. I quite concur in the definition by "Opifex" of the two objects desired by the Council. "Firstly, to make union with the Society and improvement in pharmacy as easy and inexpensive as possible; and secondly, to offer an inducement to those who cannot afford that course of instruction which we should desire, and which would make them accomplished chemists, yet to fit themselves by a lower degree of attainment for a creditable discharge of the duties devolving upon a chemist and druggist." But in the accomplishment of these excellent objects we must not upset the design and advantage of our Pharmacy Act, by allowing half-fledglings to assume the privileges of a pharmaceutical chemist, and to enter and remain in business as Associates of the Society; for by so doing we should only confuse the public by a distinction without a difference, for the exhibition of the certificate of examination as an Associate of the Society would lead the public to infer that the holder was a pharmaceutical chemist, and we well know that the public is obtuse enough with respect to such educational distinctions. I am even doubtful about the policy of giving a fully signed certificate of examination for the minor; I think a small certificate of the fact, signed by the President, and countersigned by the Secretary, would meet all the requirements of assistants as such. A certificate signed by all the examiners would then have more value in the eyes of the major student, who would be a pharmaceutical chemist by law, and a member elect. Whether the standard of examination might be safely lowered for this title, and an honorary distinction conferred on candidates passing a meritorious examination, is a question well deserving the attention of the Council at the present moment, and I perceive that the present as well as the past by-laws give discretionary power

to the Council in this respect. Let us beware of the danger of educating men above their station, who will leave us for other professions; but let us seriously endeavour to educate men to the duties of the trade as demanded by the public. The idea of local examinations has always been entertained by some of the well-wishers to the Society, but the question has been repeatedly held in abeyance to await a general desire in their favour. It is a point upon which the Council can scarcely anticipate with a good grace the wishes of the members; let these be distinctly expressed, and I have no doubt the Council will be very glad to adapt their present machinery to the accomplishment of this object. I am, Sir, yours faithfully,

"MAJOR."

Liverpool, May 22, 1863.

ILLEGAL SALE OF ARSENIC.

Patrick C. Flannagan, shopkeeper, Whitworth Road, was summoned on three separate charges: the first was for selling threepennyworth of arsenic to James Holt, deceased, on the 4th of April, without being mixed with other ingredients; second, with delivering the same without having forthwith entered it in a book kept for that purpose, and the date of sale; thirdly, with delivering the same to James Holt, without obtaining his signature in a book required to be kept by him for that purpose. Mr. Superintendent Sylvester, after repeating the charges, remarked that this case was one of great importance to the public of Rochdale; and related the circumstances disclosed at the inquest. The defendant pleaded guilty to each charge, therefore the examination of witnesses was not gone into. Mr. Whitehead, who appeared for the defendant, said that Mr. Sylvester had stated the case fairly and honestly, and he hoped the Bench would allow him to make a few remarks in defence. The transaction had been very unfortunate, and nobody was more sorry for what had happened than the defendant himself. It turned out, from what had been stated that morning, that the deceased went to the defendant's shop very early on the morning of the 4th of April, and asked for strychnine to kill rats with. Flannagan told him that he would not sell it, only to medical men. The deceased then asked for arsenic, saying that he wanted it for the purpose of killing rats. Mrs. Flannagan knew something of the transaction; and the deceased, through marriage, had become a relation of Flanagan's; and she believed him to be a man of sober habits, and told her husband that it would be all right to let him have poison. His client did enter the purchase in a book, but not in a form according to statute. He would be warranted in saying that the defendant's previous character was good. He had been many years in the 47th regiment, and on leaving had received an excellent character from all the officers in the regiment. He thought they might attribute some want of care in selling the arsenic, as he did, but not moral blame. After leaving the army he carried on business as a druggist, but was unfortunate; he afterwards entered the service of Mr. Knowles. He was a married man, and had six children; and had lately again worked himself into business. Taking into consideration that his wife was related to the deceased, and the right he thought he had of selling the arsenic, and taking into consideration the way he gave his evidence at the inquest—openly and frankly, and did not varnish or conceal anything—even the coroner and the jury admit this—he would ask them to deal with the case as leniently as they could. Nobody felt his position more acutely than he did, and he could not recall the dead man to life. He would ask them to take his character into consideration, and his efforts from time to time to place himself in a respectable position; and he hoped they would deal leniently with the case.—The Chairman: Has he been educated as a druggist?—Mr. Whitehead: He has assisted a relation of his, who was a surgeon, for one or two years.—The Bench said that the defendant had rendered himself liable to three informations; but, taking all the circumstances into consideration, they would only convict him under one, for not mixing the arsenic with indigo, and would fine him £10 and costs; for the other two informations he would have to pay costs.—Mr. Whitehead: Will your worships allow him some time to pay the money in?—The Chairman: We have no objection to allow him a fortnight.—*Rochdale Observer, April* 18*th.*

ON THE DISCOVERY OF THE METAL THALLIUM.

BY WILLIAM CROOKES, ESQ., F.C.S.

Lecture delivered at the Royal Institution of Great Britain, March 27, 1863.

The speaker commenced by remarking that the discovery of a new metal was no novelty in this century. Since its commencement, our knowledge of the material world had been increased by the discovery of no less than thirty-two of these elements. Glancing rapidly at the already known metals, the speaker said that seven of these were known to the ancients, and we have no knowledge of their first discovery. We know, however, that many are found native, and the others are separated from their ores either by heat alone, or by heat and the simplest chemical agencies. Most of those of more recent discovery have been obtained by exclusively chemical means, the exceptions being those, the separation of which, by means of voltaic electricity, by Sir Humphry Davy, makes the commencement of this century a marked epoch in the history of chemistry, and also of the Royal Institution. From the time of Sir Humphry Davy no new method for the recognition of elements had been discovered until the researches of Bunsen and Kirchhoff gave to the scientific world a definite knowledge of analysis by means of the spectrum. By this means Bunsen discovered the two new alkali metals cæsium and rubidium, and by the same means the speaker was led to the discovery of Thallium.

The special history of the discovery of the last-named metal offered a curious parallelism to the discovery of selenium by Berzelius. The great Swedish chemist was engaged on the examination of a residue from a sulphuric acid manufactory, in which he was induced to suspect the presence of tellurium. A complete examination proved to him that tellurium was absent; but in the course of his experiments he succeeded in separating a new element, belonging to the sulphur group, to which he gave the name of Selenium. The speaker, three years ago, was occupied in the analysis of a similar residue from some sulphuric acid works at Tilkerode, also with a view to the separation of tellurium. The sulphuric acid residue had originally been placed at his disposal by Professor Hofmann, in the year 1850, for the purpose of extracting selenium from it. In the distillation of the crude selenium, there was left behind in the retorts a residuum which a few chemical tests led the speaker to conclude contained tellurium. This was placed aside for further examination, and remained unnoticed until, in the beginning of the year 1861, it was re-examined with the object of preparing tellurium from it. Not succeeding in finding evidences of the presence of this metal by chemical means, the speaker had recourse to the recently-discovered means of spectrum analysis; but instead of noticing the alternate bands of light and shade characteristic of tellurium, he was surprised to observe a single green line of remarkable brilliancy and intensity, which had hitherto been unnoticed, and was communicated by no known element which could have been present in the residuum. (The spectrum of thallium was here projected on the screen, a 40-cell Grove's battery being used to produce the electric arc. Its green band appeared perfectly sharp and brilliant upon a dark background.) Further researches soon proved to the speaker that he was, in fact, dealing with an entirely new element; but the quantity contained in the material under analysis was so minute that the complete isolation was a matter of great difficulty. In September, 1861,* however and by means of the galvanic battery, he succeeded in precipitating the metal in a pure form; to which, in consequence of the green band it communicates to the spectrum and to flame, he had previously given the name of Thallium, from θαλλός, a bud, the colour of early vegetation most nearly resembling the shade of green it gives. The metal was shown to friends soon after isolation, and its nature freely communicated; but no formal publication of this fact was made until the opening of the International Exhibition, on May 1, 1862, where, in a case deposited some days before, were displayed several grains of the new body, labelled and described as a *heavy metal.*

By the kindness of numerous friends, among whom may be mentioned Dr. Thornthwaite, Professor Chandelon, and Mr. Peter Spence, and by the munificence of the

* At the lecture, the year 1862 was given inadvertently for 1861.

Royal Society, he has since found more prolific sources of the metal, and been able to work on a large scale.

While speaking of the metallic nature of thallium, the speaker noticed the fact of the observation of the green line and separation of the metal, on the 16th of May last, independently of himself, by a skilful Belgian chemist, M. Lamy, who deposited a specimen in the International Exhibition in June, 1862.

Thallium, the speaker said, belongs to the class of heavy metals. Its specific gravity is 11·9, very nearly that of lead. In colour it most resembles cadmium. It possesses considerable lustre, but quickly tarnishes in the atmosphere. It is very soft, being easily scratched by lead. It is very malleable, and the speaker showed that it could easily be forced into wire, several lumps welding together in the cold into one solid rod. It marks paper like plumbago, but the mark quickly disappears by the formation of a light-coloured oxide, being reproduced however by the action of a soluble sulphide. Thallium, the speaker showed, was strongly diamagnetic, being only inferior to bismuth in this respect; and Dr. Matthiesson had determined that its power of conducting electricity was very near that of lead. It is precipitated from its solution by means of the battery in beautiful crystals, the form of which has not yet been determined; and when the experiment is carefully conducted, these spread over the dish in branches like a delicate seaweed, or with a stronger solution like the club-moss. The atomic weight of thallium is about 203. Its chemical properties are at first sight rather anomalous, and seem to justify the remark of M. Dumas, that it is the ornithorhynchus of metals. That eminent French chemist ranks it with the alkaline metals, with which indeed it has some common properties; but the speaker is inclined to class it with the heavy metals, lead and silver, to which it seems more nearly allied both by its chemical and physical properties: several of the chemical reactions of thallium were shown in corroboration of this view. Like the metals potassium and sodium, it forms a soluble oxide which is endowed with strongly alkaline properties; like them too it is not precipitated by sulphuretted hydrogen, nor in its lower state of oxidation by an alkali; it also forms an insoluble platino-chloride, but here the resemblance ceases. All the other reactions are similar to those of the heavy metals. The soluble oxide is in reality also allied to the oxides of silver and lead (which are both soluble in water and alkaline), inasmuch as it has no affinity for water, being rendered anhydrous even at the common temperature in a vacuum. It is readily precipitated in the metallic form from its saline solutions by zinc. It forms an insoluble peroxide, sulphide, iodide, bromide, chromate and sulphocyanide, and a slightly soluble protochloride, sesquichloride, ferrocyanide, and chlorate.

The alloys of thallium have not yet been much studied. The uses of the metal the speaker said he was hardly yet in a position to dwell upon. At present it would appear only to confirm in the most striking manner the value of spectrum analysis as a guide in chemical research. As an agent for the production of colour in pyrotechny, it was only equalled in brilliancy by the two other elements which give a monochromatic light, lithium and sodium. The speaker here illustrated the monochromatic nature of the thallium light, by throwing the magnified image of its electric arc on a bouquet of variously-coloured flowers; and concluded by thanking the audience for the indulgence they had extended to his first public discourse.

CHLORIDE OF IRON AND SODIUM, A NEW HEMOSTATIC AGENT.

Dr. Phipson, in the 'Chemical News,' describes a new preparation containing chloride of iron, which has been introduced by Dr. Piazza, of Bologna, and has been found very efficacious for stopping the flow of blood from wounds. Solution of chloride of iron has already been used successfully for this purpose, but it has been found necessary to employ it in a concentrated state, having a sp. gr. 1·2 to 1·26, and when of this strength it often causes much pain and irritation. Dr. Piazza finds that when chloride of sodium is added to it, the proportion of chloride of iron may be greatly diminished. He recommends the use of a solution of perchloride of iron having a sp. gr. 1·075 to 1·11, mixed with an equal volume of a concentrated solution of chloride of sodium. This solution has been used in Italy and Belgium with great success. The chloride of iron must have no free acid in it.

A BILL TO PROHIBIT THE SALE AND USE OF POISONED GRAIN IN CERTAIN CASES.

Whereas it is expedient to prohibit the Sale and Use of poisoned Grain in certain cases: Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. Any person who shall knowingly and wilfully expose for sale or sell any poison or poisonous ingredient, or any grain which has been so steeped or dipped in poison, or with which poison has been so mixed as thereby to render the same poisonous and calculated to destroy life, with intent that such poisons or poisonous ingredient, or such grain as aforesaid, should be used for the purpose of injuring or destroying any birds or animals, shall in either case for every such offence, upon summary conviction thereof before *two* Justices of the Peace in England or Ireland, or *two* Justices of the Peace or the Sheriff in Scotland, forfeit and pay such sum of money, not exceeding *ten pounds*, as to the said Justices or Sheriff respectively shall seem meet, together with the cost of such conviction.

2. Any person who shall knowingly and wilfully buy any poison or poisonous ingredient, or any grain which has been so steeped or dipped in poison, or with which poison has been so mixed as thereby to render the same poisonous and calculated to destroy life, with intent to use such poison or poisonous ingredient, or such grain as aforesaid, for the purpose of destroying any birds or animals, shall in either case for every such offence, upon summary conviction thereof before *two* Justices of the Peace in England or Ireland, or *two* Justices of the Peace or the Sheriff in Scotland, forfeit and pay such sum of money, not exceeding *ten pounds*, as to the said Justices or Sheriff shall seem meet, together with the costs of such conviction.

3. Any person who shall knowingly and wilfully sow, cast, set, or place, or cause to be sown, cast, set, or placed, in or upon any ground, whether open or enclosed, any poison or poisonous ingredient, or any grain which has been so steeped or dipped in poison, or with which poison has been so mixed as thereby to render the same poisonous and calculated to destroy life, with intent thereby to destroy any birds or animals, shall in either case, upon summary conviction thereof before *two* Justices of the Peace in England or Ireland, or *two* Justices of the Peace or the Sheriff in Scotland, forfeit and pay such sum of money, not exceeding *ten pounds*, as to the said Justices or Sheriff shall seem meet, together with the costs of such conviction.

4. The powers and provisions of the Act of the eleventh and twelfth years of Her present Majesty, chapter forty-three, and in Ireland, the Petty Sessions (Ireland) Act, 1851, shall extend and apply to this Act, and to all proceedings, matters, and things to be taken, had, and done, and to all persons to be proceeded against or taking proceedings under this Act.

MISCELLANEA.

Prevention of Pitting in Smallpox.—Dr. Smart, House-Physician at the Royal Infirmary, Edinburgh, has used with success a solution of india-rubber in chloroform for the purpose of preventing "pitting" in cases of smallpox. It is thus described in the 'Scotsman' :—"The application consists of a solution of india-rubber in chloroform, which is painted over the face (and neck in women) when the eruption has become fully developed. When the chloroform has evaporated, which it very readily does, there is left a thin elastic film of india-rubber over the face. This the patient feels to be rather comfortable than otherwise, inasmuch as the disagreeable itchiness, so generally complained of, is almost entirely removed; and, what is more important, "pitting," once so common, and even now far from rare, is thoroughly prevented wherever the solution has been applied. It may be as well to state that india-rubber is far from being very soluble in chloroform, so that, in making the solution, the india-rubber must be cut into small pieces, and chloroform added till it is dissolved. The

* This Bill has been withdrawn, as will be seen by the Annual Report, p. 537.

medical gentleman who has introduced this treatment has tried several other substances, but found none so generally useful. For instance, gutta-percha was tried. It has the advantage of being very soluble in chloroform, and would have been a very admirable application but for the tendency it has to tear into ribands whenever the mouth is used, or even when the features play. India-rubber, on the other hand, is pliable and elastic, allowing free use of the mouth without any danger (as a rule) of its tearing off. If, however, from some cause or other, a portion is torn off, a fresh application of the solution by means of a large hair-pencil remedies the defect, and the mask is once more complete. Several patients who have had this india-rubber mask applied concur in stating that they found it agreeable to wear, and their faces were perfectly free from 'pitting,' although other parts of the body, such as the arms, were covered."

New Test for Sugar in Diabetic Urine.—It has been stated by M. Trousseau that the urine of diabetic patients rapidly renders the tincture of iodine colourless; and the fact seems to be decisively proved that glucosic urine has alone this property. The following is the mode of proceeding:—Into a test-glass containing six cubic centimetres of urine, four drops of the tincture are dropped, sometimes five or six drops being required to produce a sufficiently deep colour of the urine. In other cases, two or three drops are amply sufficient for the purpose. The circumstances rendering these different quantities necessary are not yet determined. These conclusions have been called in question by M. Dechambre, who has made several experiments, in some of which the action of diabetic urine was as complete and as rapid as stated by M. Trousseau, while in other cases the iodine was as completely decolcured by normal urine. His experiments seem to show that the principal agents in the decolouration are sulphate of potass, uric acid, and the urates of potass, soda, and ammonia.

Death from an Overdose of Chloroform.—An inquest was held at the village of Dalston, Cumberland, on Monday, May 11th, before Mr. W. Carrick, surgeon, upon the body of Mr. Gustavus Evans, M.D., who died suddenly on Saturday, May 9th. It appeared from the evidence of Barbara Nixon, the woman with whom the deceased lodged, that he had been subject to acute pain in the head and neck for some time past. On Friday night, on his return from visiting a patient at Barnard Castle, he complained that the pain was very severe. Next morning after breakfast he took his usual walk in the garden, and smoked his pipe there for half an hour, after which he went up into the drawing-room, and shortly afterwards he was found lying on the floor as if he had rolled off the couch; in about twenty minutes he became insensible. His partner, Dr. Cornelius Hall, of Carlisle, was sent for during the day, and also Mr. Brown, surgeon, Carlisle; but their efforts to relieve the patient were unavailing, and he died about 9 o'clock in the evening. It appeared that the deceased had been in the habit of using chloroform and chloric ether to relieve the pain with which he was afflicted; and it was stated in evidence that bottles containing chloroform had been found in his conveyance since his death. One of these contained water, and as much chloroform as would be taken for a dose. Dr. Hall stated that he had no reason to suppose that the deceased was suicidal; on the contrary, his circumstances were comfortable, his mind was tranquil, and on the day before his death he had expressed his intention of taking a rest from his professional duties and trying a change of air. A *post-mortem* examination of the body had been made by Mr. Brown, Mr. Hall, and Mr. Page, and they arrived at the conclusion that death had been caused by an overdose of chloroform. The coroner having summed up the evidence, the jury returned a verdict of accidental death, in accordance with the medical testimony.

Adulteration of Quinine.—Mr. J. Brendon Curgenven, in a letter to the 'Dublin Medical Press,' May 13th, states that *muriate of cinchonine* is extensively used to adulterate the disulphate of quinine, and he advises all who have quinine in their possession to ascertain by the following tests how far it is adulterated:—"Quinine is soluble in ether, but cinchonine is not; quinine mixed with water, and dissolved by adding a little chlorine water; if to this solution ammonia be added, it becomes grass-green in colour. If cinchonine be treated in the same way, the ammonia produces a white precipitate."

Death from Swallowing Blue Pills.—An inquest has lately been held at Rogate on a woman named Caroline Stevens, who died from mercurial poisoning brought on by taking blue pills. It appeared from the evidence that she had once been ordered by a medical man to take a quarter of an ounce of blue pill in a month. She derived benefit from the prescription, and the next year she procured more in larger quantities, which she took till it affected her mouth. The following two years she obtained still larger quantities, and on both occasions it produced more or less salivation. She usually procured it in lumps of a chemist living at Petersfield. She thought the last time that she left it off too soon. On the present occasion she procured more, and had been taking it six weeks. Dr. Peskett, who attended her, found, by directions of the deceased, in an old wardrobe, done up in a quack medicine paper, ten rolls of pills, which he produced. Each roll was $1\frac{1}{4}$ inch in length, and $1\frac{1}{6}$ inch in circumference. Deceased told him that she usually took fifteen pills twice a-day; on one occasion she took fifteen three times in one day; for several weeks not less than twice a day. The druggist who sold her the blue pill said she had been in the habit of buying three or four ounces at a time. He sold it under the impression that she and her husband had bought the pills for the purpose of retailing them in the country.—*Medical Times and Gazette.*

Rouge for the Complexion.—A correspondent of the 'Chemical News,' May 16th, states that he analysed a bottle of the "rouge" with which the Arabian girls paint their faces, and found it to consist of a solution of Hofmann's "acetate of rosaniline" in rose water.

REVIEW.

The Nature and Treatment of Gout and Rheumatic Gout. By Alfred Baring Garrod, M.D., F.R.S., Fellow of the Royal College of Physicians, Physician to King's College Hospital, Professor of Materia Medica and Therapeutics in King's College, London. Second edition, enlarged and carefully revised, pp. 618. London: Walton and Maberly. 1863.

The appearance of a second edition of Dr. Garrod's volume on Gout and Rheumatic Gout in a comparatively short period of time from the issue of the first edition, is, in itself, strong evidence of its worth, and a marked testimony of its popularity. Nor is this popularity undeserved, for every chapter bears internal proofs that its author possesses great powers of observation and discrimination, combined with originality of thought, sound practical knowledge, and skill in treatment.

The work, which is intended more particularly for medical practitioners, contains much, however, that will interest and instruct the pharmaceutist. Thus, the chemical constituents of the blood and urine in gout and rheumatic gout, and the means of readily detecting the same, are matters of which no thoroughly-educated chemist should be ignorant. Some knowledge of the different remedies employed in the treatment of gout, their doses and effects upon the system; the causes which produce gout; the best means of guarding against its attacks; and the diet which is adapted for those predisposed to, or suffering from it, will be also found of real value. Full details upon these points, communicated in a lucid and readable manner, may be obtained from the present work.

The chapters treating of the blood and urine in gout are extremely important, and worthy of close study. The author, after giving the composition of healthy blood, and showing that its normal constituents are not necessarily modified in gout, concludes that "it is in the augmentation of those principles which exist in health, in such minute traces as to be detected with difficulty, that the peculiar alteration of the blood in this disease is manifested." He then proceeds to show that *the blood in gout is invariably rich in uric acid.* This fact we consider our author has quite proved. Speaking of the condition of the urine in gout, Dr. Garrod says, that experience has convinced him of the great importance of attending to the state of the urine in gout. Every one who

has accurately observed the progress of this disease will, we are sure, agree with him in this statement. He adds, "I can positively affirm that the presence of a slight amount of albumen is very common in the chronic form of the disease; in acute gout it is less frequent, and often disappears after the paroxysm has subsided; but in the chronic variety, it is usually permanent, although it may vary much in amount. . . . . I am no less convinced of the truth of my statement as to the deficiency of uric acid in gouty urine, and that the defective elimination generally bears a close relation to the inveterate character of the malady."

Our author, as is well known, first proposed the salts of lithia as therapeutic agents in the treatment of gout. They owe their value in this disease essentially to the remarkable properties they possess of imparting solubility to uric acid, the urate of lithia being the most soluble of the known urates. After referring to the mode of administering the salts of lithia, our author says, "I wish it particularly to be understood that I do not consider lithia will in any way replace colchicum as a remedy for gouty inflammation; it may prove a valuable adjunct, but its chief use is, in chronic gouty cases, to ward off attacks and remove the remnants of the disease; it is likewise valuable when administered as part of the prophylactic treatment." He adds: "Lithia salts are of little or no avail in rheumatoid or chronic rheumatic arthritis, a disease often termed rheumatic gout; if administered in this affection, their use will most probably lead to disappointment." He also states, that although many of his patients had continued the use of lithia salts for a long time, he had never been able to detect any injurious effects therefrom.

Our space, and the essentially medical character of the greater portion of Dr. Garrod's very valuable and original work, will not allow of a more detailed notice in this journal; but we cannot conclude our short sketch of its leading characteristics without recommending it in the strongest manner to our readers.

BOOKS RECEIVED.

A Manual of Chemical Analysis, Qualitative and Quantitative, for the Use of Students. Part I. Qualitative. By Henry M. Noad, Ph.D., F.R.S., etc. London: Lovell Reeve and Co., 5, Henrietta Street, Covent Garden. 8vo. pp. 211. 1863.

Practical Advice to Amateur Photographers; or, the Direct Negative Process, *viz.* Strengthening Positives. By Henry Matheson. London: James How, successor to George Knight and Sons, Foster Lane.

The Universal Text-Book of Photography; or, Instructions, Hints, Formulæ, and Useful Information on the Various Photographic Processes, Instruments, Art-Desiderata and etceteras required to be known by Professional and Amateur Photographers; with a Chapter on the Æsthetics of Photography, from the French of Monsieur Disderi. Leeds: published by Harvey, Reynolds, and Fowler, 10, Briggate. 1863.

Report of Proceedings at the International Congress held at the Crystal Palace, Sydenham, on the 11th, 12th, and 13th of August, 1862, to "discuss the general subject of cruelty to animals, and especially vivisection, and other operations upon living animals for the purpose of instruction in surgery." From the Secretary.

Who to Consult? or, a Book of Reference for Invalids, in Disordered Health, Difficult Cases, or Long-standing Disease. Including a simple nosological arrangement of the Medical and Surgical forms of Disease (suited for easyreference), together with a List of the most distinguished Physicians and Surgeons of the day; an Explanatory Glossary of Pathological Terms, etc. A corrected and revised edition will be published annually. London: Aylott and Son, 8, Paternoster Row. 1863. (From the Publishers.)

The Medical and Surgical Review (Australian). Edited by James Keene, late surgeon of the West London Hospital. No. 1, Vol. I. March, 1863. Melbourne: F. F. Baillière.

TO CORRESPONDENTS.

Wanted copies of the May, June, July, and August numbers of the Journal, 1852, for which the publishing price will be paid by Mr. Bremridge, 17, Bloomsbury Square, W.C.

J. G. (Manchester).—"Hair-dye," vol. xv. p. 144.

Pro Bono publico (Chelsea).—Free admission is only granted to medical students; but by applying by letter, enclosing name and address, to Professor Bentley, you will probably obtain an order.

R. A. P. S. (Bayswater).—Babington's 'Manual of British Botany,' and Bentley's 'Manual of Botany.'

E. T. P.—Apply to the Secretary of the Royal Veterinary College, Camden Town, London.

Astrantia (Wigan).—'Adulterations detected in Food and Medicine.' By Dr. Hassall. Price 17*s.* 6*d.* Babington's 'Manual of British Botany.'

G. E. E. (London).—(1.) All who pass the major examination with honours, between October, 1862, and August 25th, 1863, that is, at any period between the examination for the Pereira medal of last year and the present, are eligible to compete. (2.) Yes; all who reach a certain standard of excellence at the major examination are considered to pass with honours.

J. T. (Wolverhampton).—Such a work may be obtained, but it must necessarily be expensive; either Woodville's 'Medical Botany,' or Stephenson's and Churchill's 'Medical Botany' would answer your purpose, but they are now both out of print. They may, however, be occasionally met with second-hand, at much reduced prices from those they were published at, more particularly the former.

Inquirer.—(1.) *Tinctura Arnicæ.* Vol. xiii. p. 588. (2.) *Tinctura Ferri Perchloridi*—the same as Tinctura Ferri Sesquichloridi. (3.) *Solutio Ferri Perchloridi.*—Take of Ferri Rubigo 12 ounces; Hydrochloric Acid, 50 ounces: product, 42 ounces. The specific gravity of this solution, according to Pravez, should be 1·264.

A Reader (Bridgewater).—The following would answer the purpose: take of orange shellac one part, rectified spirit two parts; digest in a warm place until dissolved.

Mr. W. H. Griffith (Bristol) is thanked for his communication.

C. J., M. P. S.—"Methylated Finish" may be retailed without a license.

W. M. N. (Newark).—"Orange Quinine Wine," vol. i. p. 662; and vol. vi. p. 226. The substitution of Cinchonine for Quinine would not be justifiable.

J. C. (Bath).—"Non-colouring Solution of Iodine," when made from the formula referred to, is a solution of iodide of ammonium and iodide of potassium.

A Young Man from the Country is thanked for his suggestion.

J. T. B.—Superphosphate of lime is made by treating ground bones with sulphuric acid.

X. X.—Sulphite of lime is precipitated from the solution of bisulphite by boiling, the excess of sulphurous acid being driven off. The quantity of sulphite present may be thus estimated.

Mr. Tibbs is thanked for his communication, which is under consideration.

C. W. B.—The Junior Bell Memorial Scholarship is open to competition to Associates, Apprentices, or Students of the Society, who are under twenty-one years of age.

Erratum.—Page 519, for "D. Argyll Robertson," read "Dr. Argyll Robertson."

Instructions from Members and Associates respecting the transmission of the Journal, before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

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